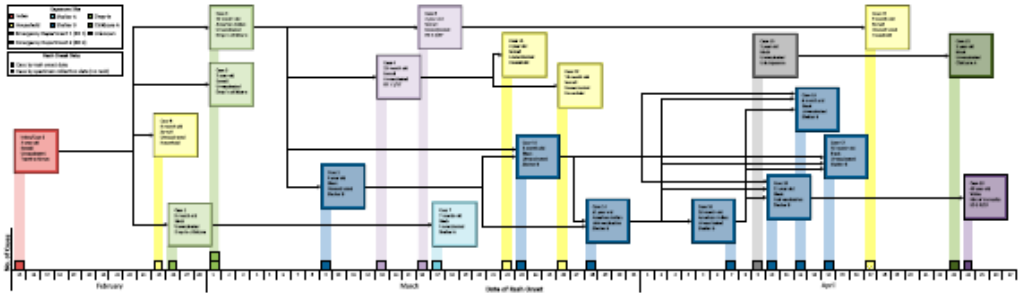
Extraction tables

Systematic review on the incubation and infectiousness/shedding period of communicable diseases in children

Vaccine preventable diseases (n=19)

Measles (n=7)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Gahr Journal: Pediatrics Pub Year: 2014 Aim: To determine the source, prevent transmission, and examine MMR-vaccine coverage in a community affected by a measles outbreak.	Country: United States Study design: Outbreak investigation Study period & duration: February 15 to April 24, 2011	Setting: Community and two homeless shelters Source population: Residents of Hennepin County Sample: *n=21 cases; of 1 index case and 20 community cases; of the community cases17/20 were unvaccinated (2/20 unknown vaccination status, 1/20 vaccinated); of the unvaccinated cases 16/17 had a known exposure (serial interval presented for this group) *Age among the 16 unvaccinated cases with known exposure: 4 months to 4 yrs; median age: 17 months *Gender: NR	Disease/infectious agent: Measles Case definition: *2010 Council of State and Territorial Epidemiologists clinical case definition for measles: fever ≥38.8°C, generalized maculopapular rash lasting ≥3 days, and at least 1 of cough, coryza, or conjunctivitis; and *Laboratory confirmed, or epidemiological link to laboratory-confirmed case Sampling (specimen, frequency, duration): *Serology *NA Lab Method: Serology (positive measles-IgM or ≥4-fold rise in measles IgG), measles virus isolated in culture, or a positive reverse-transcriptase PCR

Outcome definition, results		Comments, limitations
Outcome definition: Serial interval: Time from rash onset case in a case and its secondary case Results: Serial interval: *Range: 5-32 days *Median: 13.5 days (Data extracted from figure by Pallas)	*Figure. Confirmed measles cases by exposure site and rash onset date 	Comments: NR Limitations: *Serial interval, not incubation period

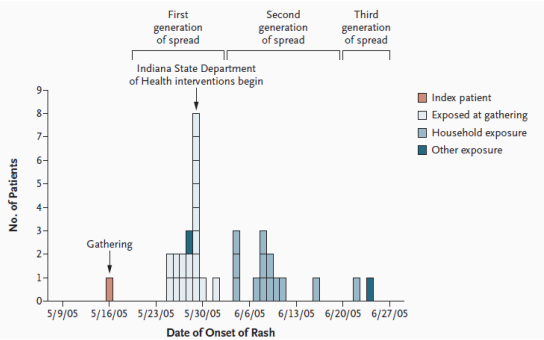
Ig: immunoglobulin; MMR: measles-mumps-rubella; NR: not reported; PCR: polymerase chain reaction; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Lempriere Journal: BMJ Pub Year: 1931 Aim: To describe some unusual features of a small epidemic.	Country: NR, appears to be England Study design: Outbreak investigation Study period & duration: May 3 to June 28, 1930	Setting: School Source population: Pupils of Haileybury College Inclusion criteria: *Developed measles during the outbreak at the school Sample: *n=530 pupils in a school, among whom, n=115 were not protected by a previous measles attack, n=14 cases; incubation period based on 12 cases (first and last cases excluded from analysis because of uncertain incubation period) *Age NR, all pupils *Gender: NR	Disease/infectious agent: Measles Case definition: *NR, but based on symptoms. Sampling (specimen, frequency, duration): *NA Lab Method: NA

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: NR, probably intervals between exposure and the onset of symptoms Results: *Range: 10-20 days *Average: 16 days *Median: 17 days Exclusion period: Known contacts excluded for 10 days (6th-16th day after exposure). Based on the symptoms (well-marked rash and profuse Koplik's spots) of the first cases Children with whom the first case had been in contact and who had not had measles previously were excluded for 10 days, from the 6th to the 16th day after exposure. Results: Failed, the infection was still introduced in the school	Comments: *The author comments that the either Koplik's spots are not the absolute diagnostic sign of measles, as is generally held, or that under certain conditions the incubation period of measles may exceed a maximum of 16 days. In the author's experience the long incubation period is unique Limitations: *Very short report *Case definition is unclear *No laboratory confirmation

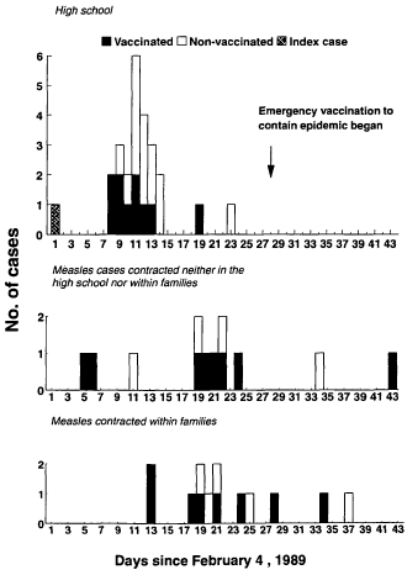
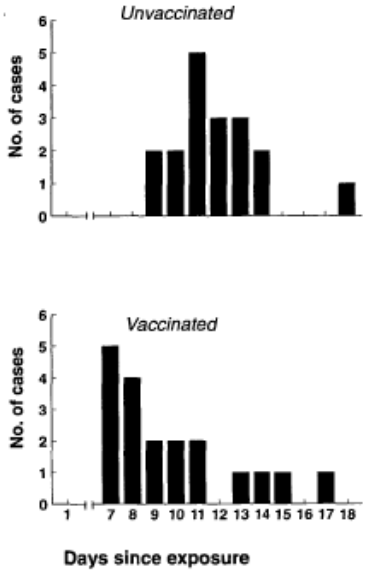
NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Parker Journal: New Eng J Med Pub Year: 2006 Aim: To investigate transmission patterns, rates of vaccination coverage, and costs of containment activities related to the outbreak to determine whether new policies are needed to sustain the elimination of measles in the United States.	Country: United States Study design: Outbreak investigation Study period & duration: May 2 to July 8, 2005	Setting: Community Source population: People who attended a church gathering in Indiana and their community Inclusion criteria: *Measles infection *Incubation period only for those who attended gathering Sample: *Ca. 500 people attended a church gathering with the index case, of whom n=18 contracted measles (of whom 16 lacked evidence of measles immunity). During the entire outbreak, 34 people acquired measles. *88% of the 34 measles cases were <20 yrs *Gender: NR	Disease/infectious agent: Measles virus Case definition: *Symptoms or signs during the outbreak that were compatible with the standard clinical definition of a case of measles; or clinical symptoms and *Either laboratory-confirmed acute measles infection or epidemiologically linked to a patients with laboratory-confirmed measles infection Sampling (specimen, frequency, duration): *Serum or urine *NA Lab method: Serum: IgM EIA capture assay Urine: PCR

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: Time from exposure at gathering to day of onset of rash Results: Range: 9-16 days; mean: 12.1 days; median: 13 days (Calculated by Pallas, based on numbers read from figure by Pallas)	*Figure. Patients with measles, according to day of onset of rash  	Comments: NR Limitations: *Some mixed data: 2/18 people that acquired measles at the gathering had evidence of measles immunity; and 12% of all people that acquired measles during the entire outbreak (including secondary cases) were ≥20 yrs of age

IgM EIA: immunoglobulin M enzyme immunoassay; NA: not applicable; NR: not reported; PCR: polymerase chain reaction; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Paunio Journal: Am J Epidemiol Pub Year: 1997 Aim: To examine whether differences in measles inoculum intensity affected measles risk among vaccinees and whether properly vaccinated measles patients became contagious during an explosive school outbreak in a small rural Finnish municipality in 1989.	Country: Finland Study design: Outbreak investigation Study period & duration: 1989 (the outbreak was contained within 3 weeks)	Setting: High school Source population: High school in Honkajoki, a small agricultural municipality in south-western Finland (three junior classes, n=76, aged 13-15 yrs and three senior classes n=68, aged 16-18 yrs) Inclusion criteria: *For high school students: measles cases exposed to the index case on February 4, 1989 *For secondary cases: symptoms and signs commenced 7-18 days after onset of symptoms in another case in the same household Sample: *n= 51 measles patients (of which 34 laboratory-confirmed); n=25 cases in high school (of which 22 infected in one day), and n=15 secondary cases within families *Age of the 22 school cases: 13-15 yrs: n=21; 16-18 yrs: n=1; age of secondary cases: children *Gender: NR	Disease/infectious agent: Measles Case definition: *Measles defined according to CDC criteria; however, date of disease onset was not based on onset of rash (nurse asked patients when they "came down with measles") *Primary cases: infected outside the home; secondary cases: infected at home by a sibling and symptoms and signs started 7-18 days after the onset of symptoms in another case in the household Sampling (specimen, frequency, duration): *Serum Lab Method: Serology

Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: 1) For high school students with measles: number of days since exposure to index case on February 4, 1989 until student "came down with measles" (the authors note the index case likely infected 22 students in one day) 2) For high school students with measles and for the secondary cases in the family: number of days since exposure Results: 1) Incubation period among non-vaccinated high-school students with measles (n=13): Range: 9-14 days Median: 12 days 2) Incubation period among non-vaccinated high-school students with measles and non-vaccinated secondary cases (n=18): Range: 9-18 days Median: 11.5 days (Calculated by Pallas based on numbers read from figures)	Figure. Course of measles outbreak in Honkajoki high school (on the x-axis days since February 4, 1989) 	Figure. Measles incubation periods in unvaccinated and vaccinated individuals 	Comments: *Incubation period in vaccinated high school students with measles (n=9): range 8-13, median 10. Incubation period in vaccinated high schools students with measles and secondary cases (n=19): range 7-17, median 10 days. *Vaccinees had an approximately 2 days shorter incubation time than unvaccinated persons ($p<0.001$). To the knowledge of the authors, It has not been previously suggested that the incubation period among vaccinees may be shorter than that among non-vaccinees; therefore, the found observation must be validated by additional studies *Vaccinated and unvaccinated students with measles were equally able to infect their siblings *The local outbreak of the present study was part of the last large outbreak season in Finland in 1988-1989, when 1,749 cases of measles were serologically confirmed. *Ventilation was particularly poor in the school hallway, where a daily student assembly was held Limitations: *Imprecise definition of measles onset (nurse asked each person who contracted measles the date on which he or she "came down with measles"); but this should have made the difference between the incubation periods of vaccinees and non-vaccinees weaker not created a difference *It is possible that vaccines in Honkajoki were exposed temporarily to heat exceeding 30°C for 15-30 minutes during local transportation; which might be a possible explanation the high risk of measles upon exposure among those who had received 2 or 3 doses of vaccine
NA: not applicable; NR: not reported; yrs: years			

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Perucha Journal: Eurosurveillance Pub Year: 2006 Aim: To describe a measles outbreak in La Rioja, Spain, which began in December 2005 and mainly affected children under 15 months of age and therefore not yet immunised with MMR vaccine.	Country: Spain Study design: Outbreak investigation Study period & duration: December 14, 2005 to February 19, 2006	Setting: Child care centers Source population: Cases identified by the mandatory reporting system, the National Measles Elimination Plan, in the measles outbreak beginning in La Rioja in December 2005 Inclusion criteria: *Cases with measles Exclusion criteria: *Suspected but not laboratory-confirmed or epidemiologically-linked measles Sample: *18 confirmed cases (15 unvaccinated children <15 months; 1 child of 18 months with 1 MMR dose; 2 adults of which one unvaccinated and 1 monovalent vaccinated) *Age: 0-6 months: n=1; 7-15 months: n=12; 16 months to 3yrs: 3; >24yrs: n=2 *M/F-ratio: 6/12	Disease/infectious agent: Measles (in n=14 cases genotype D6) Case definition: According to National Measles Elimination Plan: *Suspected case: any case with maculopapular rash, high fever and one or more of the following symptoms: cough, coryza, or conjunctivitis ("suspected case"); and *Laboratory-confirmation (any case with virological diagnosis of the infection, with the diagnostic criterion of choice being indirect detection through the presence of serum IgM-specific antibodies and/or detection of measles virus genome by RT-PCR, n=17), or confirmed case with epidemiological link (any suspected case that could not be studied by a laboratory for serological confirmation and that had been in contact with a serologically confirmed case of measles in which onset of rash too place 7-18 days before the current case, n=1) Sampling (specimen, frequency, duration): *Serum, urine and/or nasopharyngeal exudate *NA Lab Method: *Serodiagnosis by IgM-specific indirect ELISA; or *PCR

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: NR Results: Range: 9-18 days Mean: 13.8 days	Comments: NR Limitations: *Definition of incubation unclear, it is possible that it might be a serial interval instead *Some mixed data (cases include 2 adults and 2 partially vaccinated individuals)

ELISA: enzyme-linked immunosorbent assay; Ig: immunoglobulin; M/F-ratio: male-to-female ratio; MMR: measles-mumps-rubella; NA: not applicable; NR: Not reported; PCR: polymerase chain reaction; RT-PCR: PCR: polymerase chain reaction; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Shiraishi Journal: Kansenshogaku Zasshi Pub Year: 1990 Aim: To examine virus isolation of peripheral blood leukocytes and respiratory secretions from onset of rash and fever, separately in children.	Country: Japan Study design: Case series Study period & duration: February 1988 to January 1990	Setting: Hospital Source population: Patients with immune or nutrition disorder who visited the pediatric outpatient department of Tokyo Hospital Inclusion criteria: *Patients aged under 18 years old, *Diagnosed either by clinical symptoms or lab testing *Immune or nutrition disorders Sample: *n=47; n=46 based on clinical diagnosis and n=1 was laboratory-confirmed *Age range: 6 months to 17 yrs *Gender: NR	Disease/infectious agent: Measles Case definition: *NR, based on clinical symptoms Sampling (specimen, frequency, duration): *Peripheral blood, 66 specimens from 37 cases; *Respiratory secretion, 43 specimens from 26 cases. Lab Method: Culture

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: duration that measles virus could be isolated from peripheral blood or respiratory secretion from onset of fever or rash Results: *Days from onset of fever: Virus isolated from day 2 to day 10 from onset from peripheral blood; Virus isolated from day 3 to day 10 from onset from respiratory secretion. *Days from onset of rash: Virus isolated from 1 day before to 6 day after onset of rash from peripheral blood; Virus isolated from 1 day before to 6 day after onset of rash from respiratory secretion	Comments: *Article in Japanese Limitations: *Some patients only have one sample

NR: Not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Stillerman Journal: Am J Dis Child Pub Year: 1944 Aim: To record the attack rate and incubation period of measles in the 1940-1941 epidemic in New York city and to analyze certain significant factors that may affect the results.	Country: United States Study design: Outbreak investigation Study period & duration: The outbreak began in November 1940 and continued for 8 months; follow-up of the study participants was 9-23 days after the beginning of the exposure unless the rash developed before that	Setting: Tenement homes Source population: Susceptible children intimately exposed to measles in families living in crowded tenement homes of New York city Inclusion criteria: *Contacts for whom the patient who was the source of the infection (primary case) was seen when the measles was in the acute stage *Had not received injections of convalescent serum Exclusion criteria: *Questionable history of a previous attack of measles *Exposed in hospitals or nurseries, at play or anywhere other than in their own homes Sample: *n=266 contacts, of whom n=199 developed measles *Age range among contacts with measles: 0-14 yrs. <1yr, n=23; 1yr, n=37 ; 2yr, n=24; 3yr, n=29; 4yr, n=25; 5yr, n=22; 6yr, n=18; 7yr, n=8; 8yr, n=6; 9yr, n=5; 10-14yr, n=2 *Gender: NR	Disease/infectious agent: Measles Case definition: *NR Sampling (specimen, frequency, duration): *NA Lab Method: NA

<table>
<tr><th>Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td>Outcome definition:
Serial interval: number of days between the onset of the rash in the patient and its onset in the contact contracting the disease after the first exposure (based on the observation of Stocks 1931 that for statistical purposes in homes this is a valid measure)

Results:
Serial interval
*Range: 8-19 days
*Average: 12.4 days
*Range was 10-14 days in 80%, >14 days in 14% and <10 days in 6%

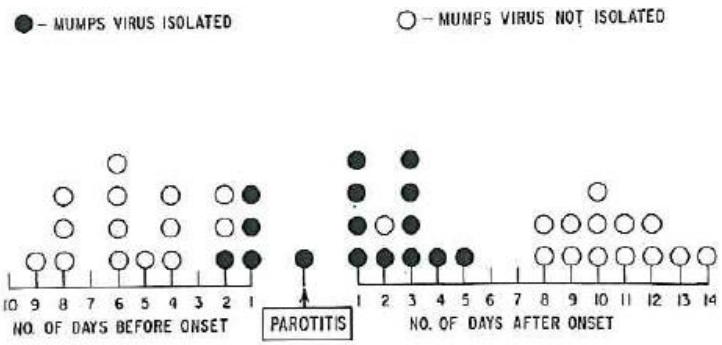
*Table. Interval in days between onset of the measles rash in the patient and its onset in the family contact
<table><tr><th>Age (yrs)</th><th>Average serial interval</th></tr><tr><td><1</td><td>13.3</td></tr><tr><td>1</td><td>13.5</td></tr><tr><td>2</td><td>12.5</td></tr><tr><td>3</td><td>12.0</td></tr><tr><td>4</td><td>12.2</td></tr><tr><td>5</td><td>11.9</td></tr><tr><td>6</td><td>11.8</td></tr><tr><td>7</td><td>11.4</td></tr><tr><td>8</td><td>10.7</td></tr><tr><td>9</td><td>11.4</td></tr><tr><td>10-14</td><td>11.4</td></tr></table></td><td>Comments:
NR

Limitations:
*No case definition given
*Serial interval, not incubation period</td></tr>
<tr><td colspan="2">NA: not applicable; NR: not reported; yrs: years</td></tr>
</table>

Meningococcal disease (n=0)

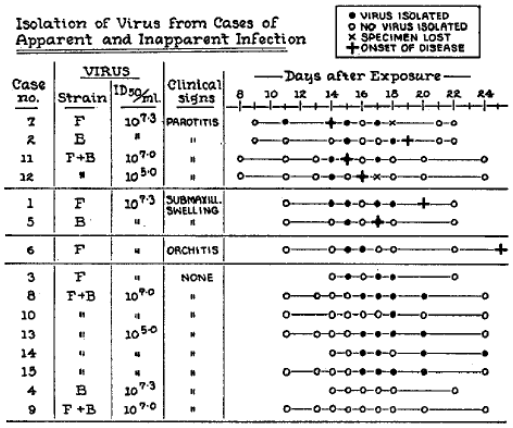
Mumps (n=2)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Brunell Journal: N Engl J Med Pub Year: 1968 Aim: To study the effect of isolation of patients with parotitis on the spread of mumps.	Country: United States Study design: Outbreak investigation Study period & duration: June 1-21, 1967	Setting: Hospital Source population: Children on a children's tuberculosis ward Inclusion criteria for duration of shedding: *Date of infection was known *Exposed to index case *Developed parotitis Sample: *n=15 children exposed to the index case; n=12 + index case were not immune to mumps at the start of the study are were included; duration of shedding based on data from n=7 children whose date of infection was known, who were exposed to the index case and who had parotitis *Age range: 16 months to 12 yrs *Gender: NR	Disease/infectious agent: Mumps Case definition: *NR, but the children who were investigated for duration of shedding all developed mumps parotitis Sampling (specimen, frequency, duration): *Pharyngeal swabs *First sample 15 days after onset of parotitis in index case, thereafter 3x a week (Monday, Wednesday and Friday of each week) Lab Method: Virus isolation was based on cultures

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Duration that mumps virus could be isolated from the pharynx by day before/after onset of parotitis Results: Mumps virus was isolated in samples 2 days before the onset of parotitis up to 5 days after the onset of parotitis Exclusion period: At the first sign of parotid swelling, children were transferred to the infectious-disease service, where they were isolated. Results: Ineffective, all susceptible children got infected	*Figure. Results of virus isolation studies on serial pharyngeal swabs obtained from 7 children in whom mumps parotitis developed  	Comments: NR Limitations: *All children were in a tuberculosis ward

NR: not reported; yrs: years

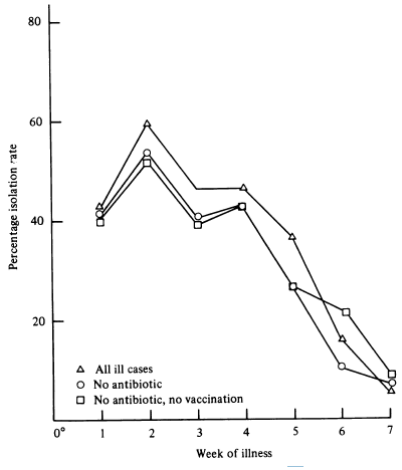
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Henle Journal: J Exp Med Pub Year: 1948 Aim: To study the presence of mumps virus at various stages of infection.	Country: NR, appears to be United States Study design: Case series (experimental infection) Study period & duration: Experiment 1: November 1947; Experiment 2: January 1948	Setting: Hospital Source population: Institutionalized children Inclusion criteria: *In good physical condition *Without known histories of mumps *Without positive test results for antibodies against mumps complement fixation antigens in serum Sample: *n=15 children (Experiment 1: n=7 children exposed to active mumps virus which was deposited by means of a coarse spray on the mucous membrane of the oral cavity; Experiment 2: n=8 were exposed to finely dispersed virus, by means of an atomizer), of whom n=7 developed symptoms of mumps *Age: NR *Gender: NR	Disease/infectious agent: Mumps (strains F and B) Case definition: *NR (4/15 came down with a clinically well-defined parotitis, 2/15 cases showed signs of involvement of the submaxillary glands, 1/15 developed orchitis without parotitis) Sampling (specimen, frequency, duration): *Saliva or mouth washings *Obtained 6-8 times after exposure Lab Method: Inoculation of chick embryos, pools of amniotic fluids of eggs were used as antigens for complement fixation tests with known acute and convalescent sera of patients with mumps

Outcome definition, results		Comments, limitations
Outcome definition: *Incubation period: Intervals between exposure to onset of symptoms (parotitis, parotid swelling, submaxillary involvement and orchitis). *Period of shedding: Number of days from onset of symptoms to last day the virus can be isolated Results Incubation period: Range: 14-25 days Median: 17 days Mean: 18 days Period of shedding: *All patients with involvement of the salivary glands excreted virus beginning on the 11th to 15th day after exposure, 2 to 6 days prior to onset of clinical signs of disease and extending up to the 4th day of illness. *The patient with primary orchitis without any recognized involvement of the salivary glands excreted virus for 2 days, beginning on the 15th day after exposure and 10 days prior to his illness. Day from onset of symptoms to last positive sample: Range: 0-3 days; median 0 days Day from onset of symptoms to first positive sample: Range -10 to -1; median -2 days (i.e. these were before the onset of symptoms) *Days from exposure to last positive sample: Range 14-18 days; median 17 days	*Figure. Isolation of virus from cases of apparent and inapparent infection  	Comments: *Incubation period was calculated based on 7 cases with symptoms, duration of infectiousness was based on 13 cases who revealed virus 6 cases: involvement of the salivary glands; 1 case: orchitis; 8: no signs of illness; 2 children failed to reveal virus in any specimens. *Symptoms were checked daily, temperature was measured twice daily (and 4 times if fever was observed) Limitations: *The amount of virus to which the children were exposed and the method by which it was applied between the two experiments differed. *It is possible that the experimental results are strongly influenced by the intensity of exposure. A smaller dose of virus (< 10^5 ID50) might conceivably delay the onset of viral excretion for a few days, as well as prolong the incubation period

ID50: 50 per cent infectivity doses; NR: not reported; yrs: years

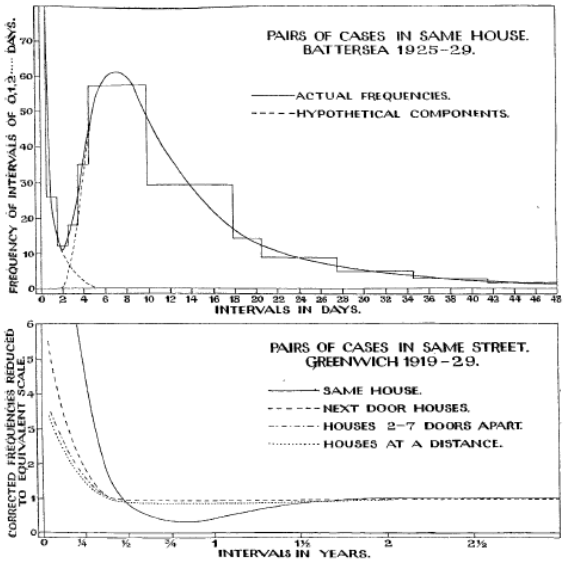
Pertussis (n=2)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Kwantes Journal: J Hyg (Lond) Pub Year: 1983 Aim: To report some of the factors influencing the isolation rate of Bordetella pertussis during a whooping cough epidemic in West Glamorgan, Wales	Country: Wales Study design: Outbreak monitoring study (population level) Study period & duration: November 1977 to early March 1979	Setting: General Pracitioners Source population: Patients in West Glamorgan (population ± 360,000) GPs made telephone notifications of whooping cough to two laboratories. Nurses visited one of two laboratories daily to collect whooping cough investigation outfits, questionnaire forms and names and addresses of notified cases. If possible the household was visited that day, and a pernasal swab was taken from the notified case as well as from any other occupant with symptoms. A 2nd visit was made 2 weeks later to make further observations and take swabs from any secondary case. After 3 months nurses made a final call to study the outcome. Sample: *212 GPs, n=2,321 cases of clinical whooping cough (out of n=3148 notified cases) of which 905 laboratory-confirmed Vaccination status only reported among those <10 yrs: 1426 (77%) unvaccinated; 882/2,321 clinical and 330/905 lab confirmed cases did not receive antibiotics. *Age among clinical cases: <5yrs, n=1,505 (65%); <10 yrs, n=1,850 (80%); adults >20 yrs, n=235 (10%) *M/F-ratio among clinical cases: 48.3%/51.7%	Disease/infectious agent: Bordetella pertussis Case definition: *Clinical whooping cough: notified cases who on clinical ground satisfied the diagnostic criteria for whooping cough Sampling (specimen, frequency, duration): *Pernasal swabs *Once (if possible on the date of case notification) Lab Method: Isolation from pernasal swabs and identification by neutralisation or immunofluorescent test

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Percentage isolation rate among all clincal cases according to the number of weeks after illness onset Results: For those without vaccination and antibiotic treatment: ~40% isolation rate at week 1, 2 and 4, ~50% at week 2, ~20% after 6 weeks and ~10% after 7 weeks since illness onset (Numbers read from graph by Pallas)	Figure. Isolation rate according to the week of illness. ▲, All ill cases; O, those not given an antibiotic and, ■, those who had not been vaccinated and were not given an antibiotic.  	Comments: *Large outbreak following a period of very low immunisation rate *The isolation rates are based on parallel measurements at different disease stages; 887/905 lab confirmed cases had disease durations >3 weeks *The isolation rate by week of illness was reportedly not influenced by either vaccination state or antibiotic therapy, although two types of antibiotics were reported to significantly reduce the chance of isolation *The Department of Health and Social Security (1977) in their memorandum on the control of infectious diseases in schools, recommends a minimum period of exclusion from school of 21 days from onset of paroxysmal cough. In the present study 15-20% of patients were still found to be carrying B. pertussis at 6 weeks and according to the authors it is therefore questionable whether exclusion from school for 3 weeks is likely to have any significant effect in controlling an outbreak. Limitations: *Only one sample per person, but large study *Reliance on recall for onset of disease

GP: general practitioner; M/F-ratio: male-to-female ratio; NR: not reported; yrs: years

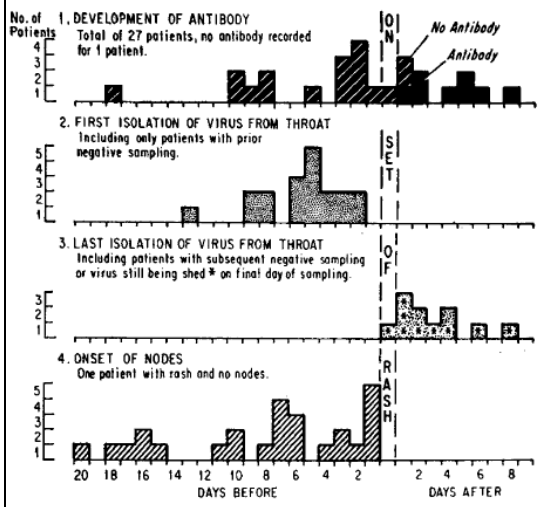
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Stocks Journal: Lancet Pub Year: 1933 Aim: To report additional observations on the sex- and age-incidence of whooping cough in London, its probable incubation period, its transmission in houses, streets and schools, and the measures which might prove efficacious in reducing its ravages.	Country: England Study design: Descriptive study of notified and reported pertussis cases in Greenwich 1919-29, Battersea 1925-30, Wandsworth 1926-28, and Holborn 1921-28 Study period & duration: 1919-1928 (Greenwich 1919-29, Battersea 1925-30, Wandsworth 1926-28, and Holborn 1921-28)	Setting: Community (house-, family, street- and school-level) Source population: London areas (Greenwich, Battersea, Wandsworth, and Holborn) Inclusion criteria: *Notified and reported cases of whooping cough in Greenwich 1919-29, Baattersea 1925-30, Wandsworth 1926-28, and Holborn 1921-28 Sample: *n=15,283 cases *Age: 0yrs, n=1657; 1yr, n=1708; 2yrs, n=1713; 3yrs, n=2036; 4yrs, n=2377; 5yrs, n=2871; 6yrs, n=1656; 7yrs, n=584; 8yrs, n=228; 9yrs, n=114; 10-15yrs, n=225; 15+yrs, n=114 for the 4 areas; incubation period was based on a subset: household data from Battersea and Greenwhich *M/F-ratio: 7263/8020	Disease/infectious agent: *Haemophilus pertussis* Case definition: *Notified and reported cases Sampling (specimen, frequency, duration): *Cough sample *NA Lab Method: Bacterial cultures; Plates of a special medium of potato, horse blood and agar were held at 6 inches from whooping-cough patients whilst coughing

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: NR Results: From the form of the curve the authors conclude that it is possible for the incubation period to be as short even as 3 days, but it will most probably be a week. The upper limit cannot be determined from this data since it is not known how long after onset the infection was conveyed to the second child	*Figure. Frequency distribution of intervals between onset of successive cases of whooping cough 	Comments: *Children with short interval between them may infected from the same outside source on different days or one from the other within the house; However, the author believes from form of the curve in the figure that direct infections with intervals as short as 2 days are possible and that almost all intervals of 4 days or more may be attributed to direct infection of the second child by the first *The author notes that owing to the greater danger of whooping cough to young (pre-school) age children, control measures should seek to protect this group from infection by school children. It is therefore speculated, that the value of excluding from infected school home contacts to whooping cough cases is questionable and that it would probably be better to keep these children at school until the first signs of catarrh or cough (the most infectious period precedes the onset of the whoop); and that isolation of cases within the home would be worthwile. Limitations: *Case definition is unclear *Incubation period is based on speculations in the light of the recorded serial intervals. *No right tail data *Difficult to read"

M/F-ratio: male-to-female ratio; yrs: years

Rubella (n=2)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Sever Journal: JAMA Pub Year: 1965 Aim: To report on the clinical and laboratory finding of the outbreak of rubella on St. Paul Island in Alaska.	Country: United States Study design: Household study Study period & duration: 5-17 June, 1963 and one follow-up in September 1963	Setting: Households Source population: Children from 14 household who lived on St. Paul Island (Pribilofs, Alaska) during a rubella epidemic in June 1963 Inclusion criteria: Children <19 yrs, examined daily by one physician during the 13 day study period. None of the children had antibody initially, but antibody developed in all by the time the final blood samples were obtained. Sample: *n=46 children, n=45 developed symptoms of rubella (60% developed clinical rubella and 40% had enlarged nodes only). First isolation of virus from throat based on patients with prior negative sampling and last isolation of virus from throat based on patients with subsequent negative sampling or virus still be shed on final day of sampling, NR how many patients this concerns. *Age range among all children: 0-19 yrs; 0-4 yrs, n=4; 5-9yrs, n=13; 10-14yrs, n=16; 15-19yrs, n=13 *M/F-ratio: 23/23	Disease/infectious agent: Rubella Case definition: NR (60% had clinical rubella with both rash and characteristic posterior auricular or suboccipital lymph nodes; 40% had enlarged nodes only; 1 had none of these findings; none of the patients had antibody initially but all did by the time the final blood samples were obtained) Sampling (specimen, frequency, duration): *Throat swab specimens *Obtained daily from June 5-17 *Blood specimens *Obtained on June 5, 17 and September 29 or 30 Lab Method: *Throat swab specimens tested for rubella using the enterovirus interference method. *Serum specimens used to detect neutralizing antibody by employing primary African green monkey-kidney roller-tube cultures.

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Numbers of days from onset of rash to first or last isolation of virus from throat Results: *For patients with both rash and enlarged lymph nodes: virus was first isolated from the nasopharynx as early as 13 days before rash; in 5 days before the rash in the majority of cases; 2 days before the rash in all cases. The virus persisted for at least 2 days following rash and in one case was still present 6 days later when sampling ended. *It is not possible to determine the total duration of persistence of virus in all cases because intensive sampling was confined to a 13-day period, but virus was detected in throat specimens for 9 days in individuals with rash and nodes and 4 days in patients with nodes only (Numbers read from figure by Pallas)	*Figure. Clinical and laboratory findings in patients with rash and notes (NB: graph 2 and 3 of interest)  	Comments: *In total, the island had 357 native inhabitants *The authors expect the present study to provide a more accurate representation of the natural disease in a civilian population, since experimental rubella is atypical in that it has a relatively short incubation time (12 days) *The authors report that the incubation period during the epidemic on the island was approximately 16 days; definition and sample size are NR *A large portion of the children did not show rash and were relatively asymptomatic ("clinically inapparent rubella"); results for these children are therefore not presented here *Adenopathy occurred as early as 3 weeks before rash; however, the majority of patients had onset of nodes 1-2 weeks before the rash, and all patients had adenopathy by the day before the rash Limitations: *Intensive sampling was confined to a 13 day period and thus clinical and microbiological data was not complete

M/F-ratio: male-to-female ratio; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Zhao Journal: Zhonghua Liu Xing Bing Xue Za Zhi Pub Year: 1992 Aim: An epidemiological and serological investigation of a rubella outbreak associated with a cinema occurred in 4 primary schools.	Country: China Study design: Outbreak investigation Study period & duration: December 20, 1989 to February 12, 1990	Setting: Primary schools Source population: Primary school students (grade 3-6) in 3 counties in China who went to a cinema during 20 December, 1989-12 February, 1990 Inclusion criteria: *Visited the cinema *Developed rubella Sample: *n=393, incubation period was based on n=169 first generation cases *Age range: 6-15 yrs *M/F-ratio: 186/207	Disease/infectious agent: Rubella Case definition: *NR, but probably based on symptoms such as fever and rash; sometimes also on laboratory-confirmation Sampling (specimen, frequency, duration): *Blood *NA Lab Method: ELISA to test rubella-specific IgM and IgG

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Probably intervals between exposure (the day of visiting the cinema) and the onset of symptoms Results: *Range: 13-24 days *Mean: 17.8 days	Comments: *Among 53 cases, 33 were IgM positive; among 7 IgM negatives, all were IgG positive > 4 titres. Limitations: NR

ELISA: enzyme-linked immunoassay; Ig: immunoglobulin; NA: not applicable; NR: not reported; yrs: years

Varicella (n=6)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Asano Journal: J Ped Pub Year: 1985 Aim: To describe the successful isolation of varicella zoster virus from the mononucleocytes during the incubation period of varicella in healthy children.	Country: Japan Study design: Household study Study period & duration: 4-month period in 1984	Setting: Hospital, households Source population: Susceptible children in households of children with onset of varicella visiting the pediatric outpatient clinic (one child who had close contacts with schoolmates with varicella was also included). Inclusion criteria: *No history of varicella. *Lives in household with child with varicella Sample: *n=12/12 children developed varicella, of whom n=11 were exposed in a family setting (and 1 in school setting) *Mean (± SD) age among all cases: 3.2 (± 1.8) yrs; range: 1-6 yrs *M/F-ratio among all cases: 8/4	Disease/infectious agent: Varicella Case definition: *NR, the 12 cases had typical manifestation of the disease with vesicular rashes; or clinical symptoms and *Laboratory-confirmation Sampling (specimen, frequency, duration): *NA Lab Method: Virus isolates identified by characteristic cytopathic effect to VZV

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period/Serial interval: Interval between onset of vascular rash in the index case and onset of exanthema in the contact Results: *Among family contacts (n=11): Range: 13-18 days Mean (± SD): 14.0 ± 1.4 days	Comments: *The serial interval in the 1 child who was exposed in school was 20 days Limitations: *Based on table headings, the period appears to be an incubation period, i.e. was calculated from moment of exposure ('contact') (day of sampling after contact + day of onset of disease after sampling); however in the text, it appears to be a serial interval, i.e. see outcome definition

M/F-ratio: male-to-female ratio; NR: not reported; SD: standard deviation; VZV: varicella zoster virus; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Gordon Journal: JAMA Pub Year: 1929 Aim: To assess the incubation time and period of infectivity in a group under strict isolation and simultaneously infected with scarlet fever.	Country: NR, appears to be United States Study design: Outbreak investigation Study period & duration: NR	Setting: Hospital Source population: Children in scarlet fever wards who had been under strict isolation for twenty-one days previous to exposure to chicken-pox Inclusion criteria: *In scarlet fever ward *For serial interval: only secondary cases were included Exclusion criteria: *For serial interval: tertiary or later cases were excluded because they were not subject to the same controlled circumstances Sample: *Serial interval based on n=67 cases; n for period of infectiousness before eruptions NR; period of infectiousness after eruptions based on 4 cases and 21 non-immune contacts *Age: children *Gender: NR	Disease/infectious agent: Varicella Case definition: *NR, but in a hospital setting, eruptions were mentioned, thus probably based on classical symptoms such as eruptions. Sampling (specimen, frequency, duration): *NA Lab Method: NA

Outcome definition, results	Comments, limitations
Outcome definition: Serial interval: Intervals between eruptions in secondary cases and lesions appeared in the primary case Results: Range: 11-20 days Median: 15 days Infectivity preceding the eruptive stage must be of short duration. *A boy (age 6), was transferred from a large scarlet fever ward to a ward for convalescents. There had been no chickenpox in either ward for several months. A beginning chickenpox eruption was noted 25 hours after the transfer. In the original ward, with a population of boys aged from 4 to 10 years, there were 8 who had never had chickenpox and 8 others with a history of the disease. Boys in contiguous beds were nonimmune. No cases of chickenpox developed within the next 22 days. In the ward to which the boy was transferred, 3 secondary cases occurred. It would appear in this instance that varicella was not infectious 24 hours preceding the eruption. *A patient (age 4) was removed in the morning from a scarlet fever ward for a mastoid operation, and thereafter isolated in another unit. No patient in the original ward gave any evidence of an unusual skin eruption in the course of routine morning baths. In the afternoon, 1 had lesions of chickenpox. The girl removed about 9 hours previously for a mastoid operation developed varicella 17 days later. *In other instances, patients discharged from wards in which chickenpox later developed were investigated by the visiting nurse at their homes. 6 nonimmune patients discharged the day previous to the discovery of chickenpox, 4 2 days previously, 5 with an interval of 3 days and 8 with a 4 day interval, all reported that chickenpox did not occur subsequently. There is some reason to believe that contact infection of chickenpox ceases about the end of the first week of the eruption or the beginning of the second. Varicella certainly is infectious by contact on or before the 5th day. *4 different patients with both scarlet fever and chickenpox have been admitted through accident or error to scarlet fever wards. They represented varicella of 8, 11, 14 and 16 days' duration. All had crusted lesions. No secondary cases were noted among 21 nonimmune contacts	Comments: NR Limitations: *All cases were infected with scarlet fever and then got chickenpox *Serial interval, not incubation period (though if there has been a single exposure perhaps it is close to the incubation period)

NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Ma Journal: MMWR Pub Year: 2006 Aim: To identify factors contributing to the higher rate of transmission in an outbreak and to assess the effectiveness of control measures.	Country: China Study design: Outbreak investigation Study period & duration: January 1 to June 24, 2004	Setting: Primary school Source population: Students in classes with outbreak of varicella at a primary school in Beijing, China Inclusion criteria: *Students who did not have varicella before January 1, 2004 *Varicella infection Sample: *n=635 students in 15 classrooms from the 4 lowest grades, analysis limited to 488 (77%) students who did not have varicella before January 1, 2004. n=5 classrooms in which primary cases was isolated only after ≥2 days of rash (3 classrooms with single primary case, 2 classrooms with several co-primary cases) n=7 classrooms in which primary cases were isolated immediately n=3 classroom without cases *Age range in the 4 lowest grades: 3-8 yrs *Gender: NR	Disease/infectious agent: VZV Case definition: *Vesicular pruritic rash in a school student lasting >4 days with onset during January 1 to June 26, 2004. Sampling (specimen, frequency, duration): *NA Lab method: NA

Outcome definition, results	Comments, limitations
Exclusion period: School policy of 7 days isolation In this study the following were compared: classrooms where exclusion took place immediately when vesicular pruritic rash was detected vs. classrooms where exclusion took place after ≥2 days Outcome measure: attack rates (ARs) and secondary attack rates (SARs) for classrooms Results: ARs 2 distinct groups: *10 classrooms with ARs <15% *5 classrooms with substantially higher ARs (40%--80%). In all classrooms with ARs >40%, ≥1 ill students had remained in school >2 days while ill with a rash (these classrooms had new teachers who were not familiar with the school's isolation policy). SARs *In the 5 classrooms in which the student with the primary case was isolated only after >2 days of rash, the SAR was 21% (34/163) compared with 1.7% (4/235) in the 7 classrooms in which the first student with varicella rash was isolated immediately, RR=10 (CI 3.7-29.0). *In 3 classrooms in which a single student with a primary case was not isolated, the SAR was 26% (29/111), RR=12 (CI 4.4-34.0) compared with those classes for which cases were isolated immediately. *In the 2 classrooms with several coprimary cases, the SAR was 9.6% (5/52) compared with the classrooms with only isolated cases, RR=5.2 (CI 1.5-19)	Comments: *The 5 classes in which a single student with a primary case was not isolated did not differ from other classrooms regarding crowding, availability of handwashing, activities involving close personal contact, or the sharing of items that might act as fomites (e.g. towels, eating utensils, and cups). Limitations: *Information on previous history of varicella disease subject to recall bias *Possibility that mild primary cases were not identified, which might explain the occurrence of co-primary cases in some classrooms. *Part of the study population was vaccinated against varicella, not taken into account in the analysis *Unclear whether exclusion policy in one class could have influenced occurrence of disease in another class

ARs: attack rates; NA: not applicable; NR: not reported; RR: relative risk; SAR(s): secondary attack rate(s); VZV: varicella-zoster virus; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Moore Journal: Am J Epidemiol Pub Year: 1991 Aim: To assess the effectiveness of the exclusion policy by evaluating the routes of chickenpox transmission in this outbreak.	Country: United States Study design: Outbreak investigation Study period & duration: October 5 to December 21, 1988	Setting: Schools Source population: 2 Ohio school with students in grades kindergarten through 12 (n=1,886). School A: elementary, junior high, high school (n= >1500) School B: kindergarten through grade 8 (n=300) Inclusion criteria: *Cases with chickenpox identified by the school nurse *Classrooms with at least 2 cases *Only cases and classrooms with cases occurring during 2 specific periods (October 5 to November 23 and November 28 to December 21, 1988) Sample: *n=215 cases in schools A and B *Age range: 4-18yrs *Gender: NR	Disease/infectious agent: Varicella Case definition: *Case defined as: Chickenpox identified by the school nurse occurring in any child from school A or B during the period from October 5 to December 21, 1988. *Case classified as occurring within one incubation period (12-17 days) after a day of exposure or at some other time after exposure Possible exposures were considered to occur on the day -before a classmate stayed home with chickenpox (prodromal) or -the day a classmate returned to school after having had chickenpox Sampling (specimen, frequency, duration): *NA Lab Method: NA

Outcome definition, results	Comments, limitations
Outcome definition: NA Results: *It was shown that cases were 3.6 (95% CI 2.4-5.4) times more likely to occur 12-17 days after exposure to a prodromal case child than at any other time. (Based on person-time analysis in kindergarten up to grade 4; 44 cases with onset during 1695 person-days of observation 12-17 days after a prodromal classmate and 35 cases with onset during 4817 other person-days of observation) *This was most pronounced in the early phase of the outbreak (RR 10.8 (95%CI 4.4-26.5)) than in the latter part of the outbreak (RR 1.9 (95%CI 1.1-3.2)). *Children exposed to a returning classmate were no more likely to have become a case 12-17 days later than at any other time (RR 0.9 (95%CI 0.5-1.5)). 15 children returned to class after <5 days of absence from school; there were no cases among their classmates 12-17 days after their return. *Risk of chickenpox 12-17 days after a prodromal classmate, returning classmate, both exposures, or neither exposure was calculated using incidence density ratios, it was found that incidence density ratio was 3.0 (95%CI 1.9-4.8) when the risk period was prodrome only, 0.8 (95%CI 0.3-1.9) for return only, and 3.8 (95%CI 1.9-7.4) (reference group: neither). Exclusion period: Children were required to stay home for 7 days from onset of symptoms or until all lesions were crusted (mean and median duration were 7 days, based on attendance records) Results: The incidence density was not higher in children exposed to cases returning to school or no exposure; also it was not higher after the return of 15 cases < 5 days (NR if lesions were crusted). From their analyses, the authors cannot tell the optimal time a child should be excluded from school. However, since most transmission occurred before exclusion, exclusion policies may have limited effect.	Comments: *The outbreak occurred despite adherence to the exclusion policy for 7 days after rash onset or until all lesions were crusted Limitations: *Several possible sources of misclassification: -Limiting exposure definition to 1 day before rash onset may lead to underestimation of transmission during prodrome -Exact exposure time/place was not fully certain -Incubation times could have been longer than the interval used (12-17 days)
CI: confidence interval; NA: not applicable; NR: not reported; yrs: years	

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Ozaki Journal: J Med Vir Pub Year: 1996 Aim: To isolate VZV from vesicles of otherwise healthy children with varicella in relation to the time after the clinical onset.	Country: Japan Study design: Case series Study period & duration: 8-month period in 1994	Setting: Hospital Source population: Children with varicella attending the pediatric outpatient department of Showa Hospital, Osaka, Japan Inclusion criteria: *Otherwise healthy children *Met case definition Sample: *n=13 *Age range: 7 months to 7 yrs *M/F-ratio: 5/8	Disease/infectious agent: VZV Case definition: *Characteristic skin lesions of primary VZV infection. Sampling (specimen, frequency, duration): *Vesicular fluid *Serially 1-3 times after the appearance of rash *Samples could not be obtained later than 6 days after the clinical onset because the lesions became crusted Lab method: Cell culture, cyotpathic effect for VZV; followed by indirect immunofluorescence assay

Outcome definition, results

Outcome definition:
Duration of shedding:
*Time since appearance of rash up to last positive sample before first negative sample or end, or to positive sample on last day of the study (definition by Pallas)
*Proportion of isolation positive sample by day after appearance of rash

Results:
*Among those with ≥1 positive sample (n=12): range 0-5 days; median 2 days of appearance of rash

*Table. Proportion (%) isolation positive by day of appearance of rash

Day since appearance of rash	Proportion of positive isolates out of all isolates	% of positive isolates
Day 0	1/1	100%
Day 1	8/8	100%
Day 2	3/4	75%
Day 3	3/8	38%
Day 4	1/2	50%
Day 5	1/6	17%

*Table. Viral isolation and antibody in vesicles

Patient No.	Day 0[a]	1	2	3	4	5
	Isolation positive (antibody[b] positive)					
1				−(+)		−(+)
2		+[c](−)				+(−)
3		+(−)		−(−)		−(+)
4		+(−)		−(+)		−(+)
5			+(−)			
6				+(−)		
7		+(−)		−(+)		
8		+(−)		+(−)		−(−)
9		+(−)	+[d](−)			−(+)
10			+(−)		+(−)	
11		+(−)		−(−)		
12	+[c](−)		−(−)		−(−)	
13		+(−)		+(−)		
Positive rates	1/1 (100%)	8/8 (100%)	3/4 (75%)	3/8 (37.5%)	1/2 (50%)	1/6 (16.7%)

[a]Day 0 is the day of appearance of rash.
[b]By indirect immunofluorescence assay (IgG).
[c]VZV was isolated from the filtrated sample as well as from the unfiltrated one.
[d]CPE observed after a blind passage.

Comments, limitations

Comments:
*All children had typical varicella and received no antiviral treatment.

Limitations:
NR

M/F-ratio: male-to-female ratio; NR: not reported; VZV: varicella zoster virus; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Poulsen Journal: Pediatr Infect Dis J Pub Year: 2005 Aim: To describe the epidemiology and risk factors for severe chickenpox in Guinea-Bissau.	Country: Guinea-Bissau Study design: Prospective household study Study period & duration: April 2000 to December 2001	Setting: Households Source population: All households in 4 peri-urban districts Inclusion criteria: *Children with definite or possible chickenpox or herpes zoster detected via an existing surveillance system Sample: *n=1,539 cases (976 primary, 461 secondary, 88 tertiary and 14 quartiary cases) *Boys: median age 4.3 yrs (IQR 1.9; 6.5); Girls: median age 4.5 yrs (IQR 2.3; 7.0) (p<0.02). 4% is >15yrs *M/F-ratio: 49%/51%	Disease/infectious agent: Varicella Case definition: *Varicella diagnosis after clinical diagnosis and interview; or clinical symptoms and *Laboratory confirmation (in subgroup) **Primary cases: infected outside the home with no confirmed cases in the house during the incubation period. **Secondary cases: cases occurring within 10-29 days after the first case in the house (based on their distributions, where the likely minimum interval was estimated at 10 days) *Co-index case (presumably infected outside the home): cases occurring after the first case but with an interval of less than the likely minimum interval Sampling (specimen, frequency, duration): *Blood samples (from a subgroup only) *NA Lab Method: Indirect enzyme-linked immunosorbent assay

Outcome definition, results	Comments, limitations
Outcome definition: Serial interval: Period between the onset of rash in the index case and onset of rash in the secondary case. If more than one possible index case existed, the individual with closest contact was chosen. Results: Compared with sleeping in the same bed, the serial interval was significantly longer both within the household or when the index case was in another household but in the same house (respectively, 15.2 days (95% CI 14.6-15.7) for exposure in the same bed, 15.9 days (95% CI 15.2–16.6) for exposure in the same room, 16.1 (95% CI 15.4-16.9) for exposure in the same household and 16.5 days (95% CI 16.0-17.1) for cases exposed from another household, p<0.01 controlled for age and gender)	Comments: *The length of the serial interval depends on intensity of exposure, suggesting that the dose of infection might be important. The intensity of contact may therefore also influence severity of infection *Treatment was given if necessary. Treatment was not further described but may apply to complications such as pneumonia Limitations: *Serial interval, not incubation period

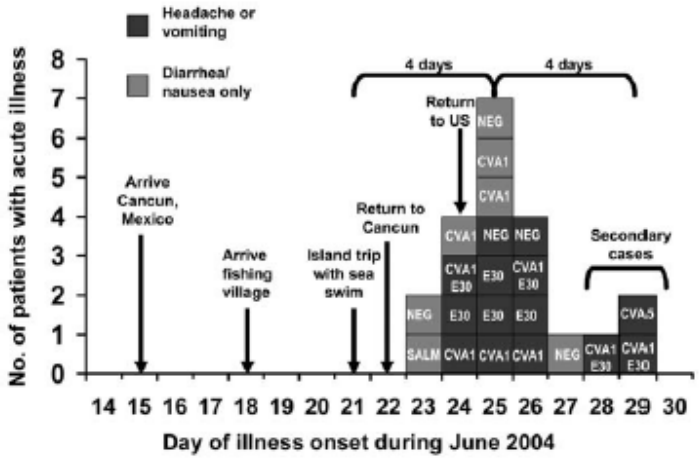
CI: confidence interval; IQR: interquartile range; M/F-ratio: male-to-female ratio; NA: not applicable; yrs: years

Food and waterborne diseases (n=78)

Viral gastrointestinal infections

Enterovirus infections (non-polio, non-hand-foot and mouth), by Coxsackie (n=1)

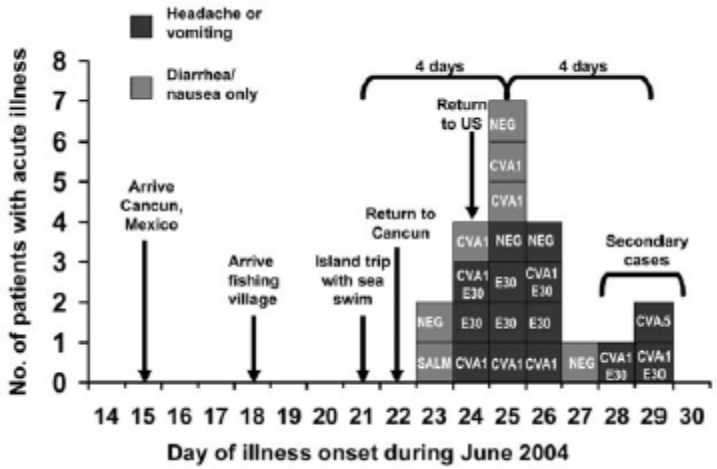
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Begier Journal: CID Pub Year: 2008 Aim: To determine the extent of the outbreak, to implement immediate infection-control measures, and to improve understanding of such outbreaks to aid in future prevention efforts.	Country: United States Study design: Outbreak investigation Study period & duration: Exposed on June 21. Follow-up till June 30, 2004	Setting: School-organized trip to Mexico Source population: Participants of a school-organized trip to Mexico Inclusion criteria: *Detection of an enterovirus Exclusion criteria: *Travelers with illness onset ≥ 27 June Sample: *n=29 travellers, of whom n=12 became ill *Age of all travellers: teenagers: n=25; and adults: n=4 *Gender: NR	Disease/infectious agent: Coxsackievirus A1 Source: The Gulf of Mexico Case definition: *Acute illness: headache, vomiting, diarrhea, nausea; and **EV* identified in stools or cerebrospinal fluid Sampling (specimen, frequency, duration): *Stools or cerebrospinal fluid Lab method: Culture, NASBA and EV VP1 RT-snPCR

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: Days between swimming in Gulf of Mexico and onset of illness Results: Exposure 4 days before primary illness peak	Figure. Summary of laboratory testing results and illness status for the travellers. CV: coxsackievirus, E30: echovirus 30, NEG: negative.  	Comments: NR Limitations: *It is possible that there were up to 4 adults among the ill travellers

EV: enterovirus; EV-30: echovirus-30; NASBA: nucleic acid sequence-based amplification; NR: not reported; RT-snPCR: real-time semi-nested polymerase chain reaction.

Enterovirus infections (non-polio, non-hand-foot and mouth), by echovirus (n=1)

Author, journal, year, aim	Country, study design, study period and duration		Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definitio
Author: Begier Journal: CID Pub Year: 2008 Aim: To determine the extent of the outbreak, to implement immediate infection-control measures, and to improve understanding of such outbreaks to aid in future prevention efforts.	Country: United States Study design: Outbreak investigation Study period & duration: Exposed on June 21. Follow-up till June 30, 2004		Setting: School-organized trip to Mexico Source population: Participants of a school-organized trip to Mexico Inclusion criteria: *Detection of an enterovirus Exclusion criteria: *Travelers with illness onset ≥ 27 June Sample: *n=29 travellers, of whom n=12 became ill *Age of all travellers: teenagers: n=25; and adults: n=4 *Gender: NR	Disease/infectious agent: Echovirus-30 Source: The Gulf of Mexico Case definition: *Acute illness: headache, vomiting, diarr **EV* identified in stools or cerebrospinal f Sampling (specimen, frequency, duration *Stools or cerebrospinal fluid *NA Lab method: Culture, NASBA and EV VP1

	Outcome definition, results	
	Outcome definition: Incubation period: Days between swimming in Gulf of Mexico and onset of illness Results: Exposure 4 days before primary illness peak	Figure. Summary of laboratory testing results and illness status for the travellers. CV: coxsackievirus, E30: echovirus 30, NEG: negative. 
	EV: enterovirus; EV-30: echovirus-30; NASBA: nucleic acid sequence-based amplification; NR: not reported; RT-snPCR: real-time semi-nested polymerase chain	

Gastroenteritis by adenovirus (n=2)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Uhnoo Journal: J Clin Microbiol Pub Year: 1984 Aim: To describe the clinical features of Ad40 and Ad41 in comparison with the established adenoviruses.	Country: Sweden Study design: Case series Study period & duration: January-December 1981	Setting: Hospital Source population: Children <15 years of age who directly sought medical advice at the Department of Pediatrics of the University Hospital of Uppsala during the study period, or for whom there was telephone consultation. Inclusion criteria: *Acute gastroenteritis *Stool samples available Sample: *n=416 ill children, n=48 had evidence of enteric adenoviruses (enteric adenoviruses (Ad40, Ad41) were found as the sole recognizable cause of diarrhea in n=30; as part of a dual infection in n=3; and established adenovirus (known non-Ad40/Ad41-adenoviruses) in n=15), n=37 with stool samples from the convalescent phase (n=26 with enteric adenoviruses infection and n=11 patients with established adenovirus infections) *Age range among all ill children: 3 weeks-13 years. 38% <1 yr; 33% 1-2 yrs; 19% 2-5 yrs; 10% >5 yrs *M/F-ratio among all ill children: 55%/45%	Disease/infectious agent: Adenovirus (Ad40 and Ad41, and other previously established adenoviruses (including Ad40, Ad41, Ad7, Ad18, Ad31)) Case definition: *Acute gastroenteritis; and *Laboratory confirmed adenovirus infection (detection in stools or seroconversions) Sampling (specimen, frequency, duration): *Stools; obtained from all patients as soon as possible after admission to the hospital, and from 1/3rd also at a later stage. *Blood; paired acute and convalescent-phase serum specimens were available from 50% of the patients. Lab Method: All stool specimens were examined by EM. Stool suspensions were prepared and cultured for virus isolation. Viral DNA was analyzed by restriction endonuclease. A genus-specific ELISA detected all adenovirus and a species-specific ELISA detected Ad40. Complement fixation (CF) test, hemagglutination inhibition (HI) assay, and ELISA were used for adenovirus antibodies.

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Duration that adenoviruses could be observed after onset of disease Results: *From 26 patients with EAd40 or EAd41 infections and 11 established adenovirus infections: no viral particles were observed 4-6 weeks after the onset of the diarrheal illness *In 9/10 patients studied, EAds were excreted in stool samples up to 8-13 days after the onset of disease, in the remaining patient virus was demonstrable for 23 days	Comments: *Nearly all patients had diarrhea, followed by vomiting, fever, abdominal pain, dehydration and respiratory symptoms *Prolonged diarrhea was common *EAds refer to previously (=in 1975) unrecognized adenoviruses that were detected by electron microscopy in stool specimens from infants with diarrhea. The two distinct species of EAds that have now been identified (=1981) are Ad40 and 41; they represent two new subgenera, F and G, respectively. Limitations: *Unclear reporting of shedding, it is possible that the data on shedding (8-23 days) is based on only one stool sample per person

Ad40: adenovirus 40; EAds: enteric adenoviruses (i.e. Ad40, Ad41); ELISA: enzyme-linked immunosorbent assay; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Van Journal: J Pediatr Pub Year: 1992 Aim: To evaluate enteric adenovirus (EAd) as a cause of outbreaks of diarrhea among infants and toddlers in day care centers.	Country: United States Study design: Prospective surveillance study Study period & duration: January, 1986-March, 1987; December 1987-April 1988; January to March 1989; October 1989-December 1991	Setting: Day care centers Source population: Children <24 months who were enrolled in 17 DCCs, in Texas Inclusion criteria: *During each study period, children up to and including 24 months of age who were newly enrolled in the DCCs were enrolled in the study. Stool specimens were collected regardless of symptoms. Sample: *n=249 children exposed, of whom n=94 children had laboratory-confirmed EAd infection, of whom n=51 had diarrhea (and n=43 were well) *Age range: 1-24 months *Gender: NR	Disease/infectious agent: Enteric Adenovirus types 40 and 41 Case definition: *Diarrhea (passage of unformed stools with at least twice the usual daily frequency); and *Detection of EAd in a stool specimen Sampling (specimen, frequency, duration): *Stools *Collected weekly during study period *When diarrhea was identified, stools were collected twice weekly Lab Method: *Children with diarrhea had a stool tested for *Shigella*, *Salmonella*, *Campylobacter jejuni*, *Aeromonas*, *Yersinia enterocolitica*, *Plesiomonas*, and *Escherichia coli* O157:H7 by standard laboratory microbiologic procedures. *Enzyme immunoassay methods were used to detect EAd, group A rotavirus and Giardia lamblia antigens. *Testing of EAd with the Adenoclone 40/41 EIA was performed.

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Total duration (i.e. including time before onset of symptoms) EAd was found in the stools Results: *Among children with a symptomatic infection: mean duration of total excretion (i.e. including time before onset of symptoms): 4.2 (± 0.4) days *9 children excreted EAd before diarrhea occurred (range: 1-7 days, mean: 2.6 days) *10 children excreted EAd after diarrhea stopped (range: 1-11 days; mean: 5.3 days) *4 children were intermittent excreters (i.e. they formed stools without detectable EAd in between watery stools in which EAd was detected)	Comments: *For study period 1, only outbreaks without a known cause were evaluated for EAd *The mean total duration of excretion among asymptomatic children was 2.8 (± 0.5) days. This was significantly shorter than in children with symptoms (p=0.04). *Overall the mean total duration of EAd excretion by children (regardless of symptoms) was 3.9 days (range: 1-14 days) Limitations: *Duration of shedding not given by number of days since onset of symptoms

DCCs: day care centres; EAd: enteric adenovirus

Gastroenteritis by astrovirus (n=3)

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr><td>Author: Cruz

Journal: J Clin Microbiol

Pub Year: 1992

Aim: To report the observations regarding astrovirus infections and diarrhea among rural ambulatory children under 3 years of age, living in a rural community of Guatemala.</td><td>Country: Republic of Guatemala

Study design: Prospective observational study

Study period & duration: February 1987 to February 1989</td><td>Setting: Rural village in the highlands

Source population: Children from different families, living in Santa María de Jesús

Inclusion criteria:
*Detection of astrovirus

Sample:
*n=321 children enrolled in the study of whom n=124 (38.6%) excreted astrovirus
*Age of all cases: 0-3 months
*Gender of all cases: 51.4% males</td><td>Disease/infectious agent: Astrovirus

Case definition:
*Diarrhea episode; and
*Astrovirus-positive sample

Sampling (specimen, frequency, duration):
*Stools
*Routine stools once a month. During episode of diarrhea, every other day. If the episode last >6 days, additional samples taken weekly and during convalescence
*Sampling till 7 days after the episode was over (72 continuous hours without symptoms). Children were followed until they reached their third birthday or for the duration of the study

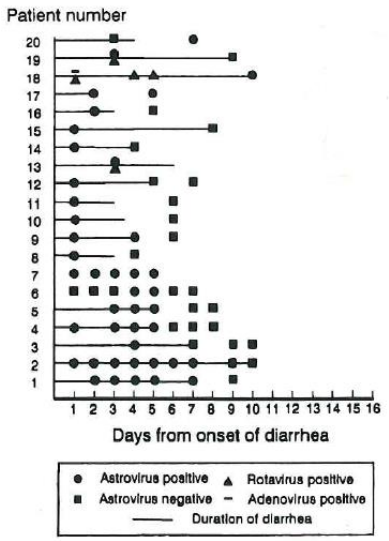
Lab method: ELISA</td></tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td colspan="3">Outcome definition:
Duration of shedding: Days calculated from initial date of illness

Results:
*Table. Proportion (%) isolations positive by initial date of illness

<table>
<tr><th>Time sample was obtained</th><th>No. of samples tested</th><th>No. (%) of positive samples</th></tr>
<tr><td>2 wk before onset</td><td>216</td><td>2 (0.9)</td></tr>
<tr><td>1 wk before onset</td><td>244</td><td>12 (4.9)</td></tr>
<tr><td>Phase of episode (days)</td><td></td><td></td></tr>
<tr><td>1-3</td><td>976</td><td>50 (5.1)</td></tr>
<tr><td>4-7</td><td>391</td><td>28 (7.2)</td></tr>
<tr><td>8-13</td><td>250</td><td>14 (5.6)</td></tr>
<tr><td>14-21</td><td>131</td><td>6 (4.6)</td></tr>
<tr><td>≥22</td><td>57</td><td>5 (8.8)</td></tr>
<tr><td>Convalescence</td><td>830</td><td>28 (3.4)</td></tr>
</table></td><td>Comments:
*Hygienic conditions are poor in Santa María de Jesús
*In 65 cases (65.0%) astrovirus shedding was accompanied by the excretion of other potential enteropathogens
*Some children had multiple astrovirus infections: n=34 had two infections and n=13 had three infections
*Astrovirus were more commonly shed during the days of illness than immediately before and after that period (p=0.01)

Limitations:
NR</td></tr>
<tr><td colspan="4">ELISA: enzyme-linked immunosorbent assay; no.: number; NR: not reported; wk: week.</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Esahli Journal: Pediatr Infect Dis J Pub Year: 1991 Aim: To assess the role of astrovirus as an etiologic agent of nosocomial and community-acquired gastroenteritis and to investigate the clinical features, epidemiology and pattern of nosocomial spread in two outbreaks.	Country: Sweden Study design: Case series Study period & duration: September 1987-December 1988	Setting: Hospital Source population: Hospitalized children at St. Goran's Children's Hospital, Stockholm Inclusion criteria: *Nosocomial diarrhea *Astrovirus was identified Sample: *n=32 cases with nosocomial astrovirus infection: incubation period was estimated based on 24/32 cases; 20/32 patients had repeated stool samples, of which n=18 were symptomatic and n=8 were symptomatic and had ≥3 stool samples *Age among all nosocomial astrovirus cases: <1yr, n=28; 1-2 yrs, n=4 *M/F-ratio among all nosocomial astrovirus cases: 12/20	Disease/infectious agent: Astrovirus Source: Nosocomial infection Case definition: *Nosocomial gastroenteritis (gastroenteritis defined as nosocomial when onset of diarrhea and/or vomiting began ≥72 hours after admission or <72 hours after discharge; diarrhea defined as an increase in frequency to >2 per 24 hours and/or a change in consistency of stool); and *Identification of astrovirus in stool Sampling (specimen, frequency, duration): *Stool *Every 3 to 4 days for 2 weeks Lab Method: Electron microscopy of stool samples. Virus isolation was performed on all cases in which no agent was identified by electron microscopy, primarily to detect nonenteric adenoviruses and enteroviruses.

Outcome definition, results		Comments, limitations
Outcome definition: *Serial interval: The interval between index case and secondary episodes *Duration of shedding: Number of days astrovirus could be identified in stools from onset of diarrhea Results: Serial interval: *Range: 2-13 days *Mean: 3 days Duration of shedding: *Among all symptomatic cases (n=18): range: 1-10 days after onset of diarrhea, median: 3.5 days after onset of diarrhea (calculated by Pallas, based on number read from graph) *Among all symptomatic cases with at ≥3 samples (n=8): range: 1-10 days after onset of diarrhea; median: 5 days after onset of diarrhea	*Figure. Duration of diarrhea and stool virus detection  in 20 cases of nosocomial astrovirus infection	Comments: *Rotavirus was found in 4/32 children and adenovirus was found in 1/32 child *30 children had diarrhea, 21 had vomiting, 10 had fever, 7 had respiratory symptoms, 5 had dehydration and 4 had metabolic acidosis *Of the 32 children, 19 children were treated with diet modification or received no treatment, 11 were given oral rehydration solution either alone or in combination with intravenous fluid, 2 children oral intake was stopped Limitations: *Serial interval, not incubation period

M/F-ratio: male-to-female ratio; NR: not reported; yrs: years

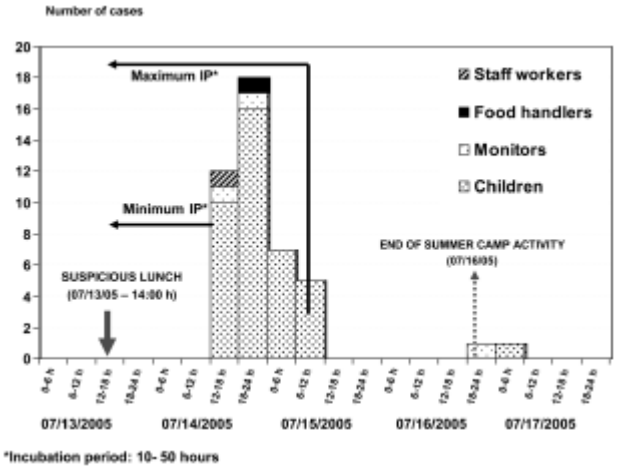
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Mitchell Journal: J Pediatr Pub Year: 1993 Aim: To evaluate astrovirus as a cause of diarrhea outbreaks among infants and toddlers in day care centers.	Country: United States Study design: Prospective surveillance study Study period & duration: January, 1986-March, 1987; December 1987-April 1988; January to March 1989; October 1989-December 1991	Setting: Day care centers Source population: Children <30 months who were enrolled in 17 DCCs, in Texas During each study period, children up to and including 24 months of age who were newly enrolled in the DCCs were enrolled in the study. Stool specimens were collected regardless of symptoms. Sample: *n=217 children tested, of whom n=73 children had laboratory-confirmed astrovirus infection, of whom n=35 were symptomatic (and n=38 were asymptomatic) *Age range: 6-30 months *Gender: NR	Disease/infectious agent: Astrovirus Case definition: *Diarrhea (passage of unformed stools with at least twice the usual daily frequency); and *Detection of astrovirus in a stool specimen Sampling (specimen, frequency, duration): *Stools *Collected weekly during study period *When diarrhea was identified, stools were collected twice weekly Lab Method: *Children with diarrhea had a stool tested for *Shigella, Salmonella, Campylobacter jejuni, Aeromonas, Yersinia enterocolitica, Plesiomonas*, and *Escherichia coli* O157:H7 by standard laboratory microbiologic procedures. *Enzyme immunoassay methods were used to detect enteric adenovirus types 40 and 41, group A rotavirus and Giardia lamblia antigens. *Astrovirus testing used the astrovirus biotin-avidin EIA and confirmed by RT-PCR.

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Total duration (i.e. including time before onset of symptoms) astrovirus was found in stools Results: *Among children with a symptomatic infection: mean duration of total excretion (i.e. including time before onset of symptoms): range: 2-30 days; median 8.5 days *13 children were excreting astrovirus before diarrhea occurred (range: 1-8 days; median: 2 days) *9 children excreted astrovirus after diarrhea had ceased (range: 1-20 days; median 2 days)	Comments: *35 cases had diarrhea, 38 cases were asymptomatic *The total duration of excretion among asymptomatic children was 2-21 days (median 4 days) *Overall the total duration astrovirus was detected in stool specimens was: range: 11 to 44 days; median: 22 days Limitations: *Duration of shedding not given by number of days since onset of symptoms

DCC: Day care centres; EIA: enzyme immunoassay; NR: not reported; RT-PCR: reverse transcriptase-polymerase chain reaction

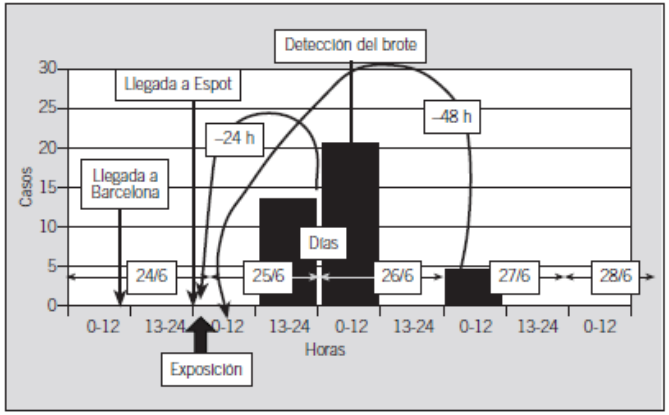
Gastroenteritis by norovirus/ calicivirus (n=14)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Barrabeig Journal: BMC Info Dis Pub Year: 2010 Aim: To investigate the epidemiological characteristics of an outbreak of gastroenteritis due to norovirus that occurred in a residential summer camp in July 2005 and in which the involvement of a food handler was demonstrated.	Country: Spain Study design: Outbreak investigation Study period & duration: Exposure on 13 July 2005. Follow-up till 17 July 2005	Setting: Summer camp Source population: Children attending the residential summer camp in Barcelona Inclusion criteria: *Acute gastroenteritis within study period *Exposed to the lunch on 13 July Sample: *n=85 people were exposed to the lunch, of whom n=44 were infected *Median age of infected: 11 yrs (range: 9-50 yrs; ~4 adults) *Gender of infected: 66% male	Disease/infectious agent: *Norovirus GGII.2* Source: Probably beef, served during the lunch on 13 July at 14:00 Case definition: *Exposed person who presented vomiting or diarrhea (three or more loose stools within 24 h); and *At least two of the following symptoms: nausea, abdominal pain of fever measured by thermometer (≥37.8°C); or clinical symptoms and *Norovirus detected in stool sample Sampling (specimen, frequency, duration): *Stools *NA Lab method: RT-PCR

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: Hours from lunch at 13 July (14:00) until onset of symptoms Results: Incubation period till onset of symptoms Range: 24-44.5 hours; mean: 32 hours	*Figure. Distribution of patients with acute gastroenteritis according to data of onset of symptoms.  	Comments: *Two cases were probably due to person-to-person transmission and not included in the incubation period. If the source of infection of the two last cases was the suspected food, the incubation period would be 78 and 83 hours, respectively Limitations: *Approximately 4 adults included in the calculation of the incubation period *Only 10 stool samples were analysed (9 infants) and in 6/10 stool samples, norovirus was detected *Pathogenic bacteria were not isolated and virus not detected in the two suspected food and the statistical analysis did not establish any food as the vehicle of infection

RT-PCR: reverse transcription polymerase chain reaction; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Godoy Journal: Med Clin (Barc) Pub Year: 2005 Aim: To investigate an outbreak of food-borne disease at a hotel.	Country: Spain Study design: Outbreak investigation Study period & duration: Exposure on June 24, 2002, outbreak started June 26 2002, investigation up to June 28	Setting: Hotel Source population: Group of 59 students and teachers at a hotel in Barcelona, Spain Inclusion criteria: *Met case definition Sample: *n=38 cases among students and teachers *Age: 15 yrs: n=17; 16 yrs: n=18; >17 yrs: n=3 *61% male	Disease/infectious agent: Norovirus Source: Sandwiches served at the hotel Case definition: *Student or teacher that presented with vomiting and/or diarrhea between the June 25 and 27, 2002, and 2 or more of the following symptoms: abdominal pain, fever, nausea; or clinical symptoms and *Culture-proven norovirus infection Sampling (specimen, frequency, duration): *Stools Lab method: RT-PCR

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: Time from exposure to start of presentation of symptoms Results: Median: 25.0 hours (range: 19-51 hours)	*Figure. Epidemic curve of norovirus gastroenteritis outbreak.  	Comments: *Article in Spanish *2 people excluded by author because uncertain if they met the case definition Limitations: *Incubation data includes data for 3 adults

RT-PCR: reverse transcription polymerase chain reaction; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Grohmann Journal: J Clin Microbiol Pub Year: 1991 Aim: To provide new information on the epidemiology of calicivirus infection.	Country: Australia Study design: Outbreak investigation Study period & duration: 12 January (one day after notification) until 15 March (Outbreak lasted 11 weeks), 1988	Setting: Day care center Source population: Children and staff members at a day care center, in Sydney Sample: *Of the n=95 children and staff members, n=53 became ill during the outbreak, calicivirus positive stools for n=24 patients during an episode of gastroenteritis *Among the 24 calicivirus positive patients during an episode of gastroenteritis; children <60 months, n=19; adult staff, n=5 *Gender: NR	Disease/infectious agent: Calicivirus Source: NR, but the outbreak started in nursery Case definition: *Human calicivirus gastroenteritis was defined as an episode of illness for which a fecal specimen collected 1 day before or within 7 days after the onset of symptoms was positive for HCV (and this was distinguished from asymptomatic cases and new onset cases) Sampling (specimen, frequency, duration): *Stool; 75 specimens from 53 ill persons in 8-day window (1 day before onset symptoms to 7 days after onset symptoms); the n=24 HCV-positive cases all had 1 sample within 8-day window *Additional 214 from 53 ill persons when they were well, outside of 8-day window Lab Method: Fecal specimens were examined by microscopy and cultured. Paired sera were tested for antibody to the Norwalk virus by EIA, selected paired sera were also tested for antibody to calicivirus from the fecal specimens by IEM

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: NR Duration of shedding: duration of virus excretion in stool samples Results: Incubation period: Estimated by the authors to be 24-36 hours Duration of shedding: *HCV was excreted from at least 1 day before until >7 days after the onset of illness *Of the 24 calicivirus positive stools from patients with gastroenteritis collected within an 8-day window (ranging from 1 day before onset of symptoms to 7 days after onset of symptoms), 6 were collected on the day before the onset of symptoms, 5 on the day of onset, 10 from days2-6 after onset of symptoms, and 3 on day 7. (NB: this information is based on one sample per person). Prolonged excretion (>7 days) was found in 2 children. (NR how many were tested) Exclusion period: *Exclusion: Until 24 hours after last episode of gastroenteritis. *Closure: 11 days One of the control measures was quarantine by temporarily excluding ill children and staff members from the center until 24 hours after their last episode of gastroenteritis; additionally the nursery was closed from January 14-25. Other control measures were: control of person-to-person spread (including improved hygiene, isolation of children who were ill from those who were well) and prevention of foodborne contamination by closing the kitchen and arranging for meals to be brought from home. Results: Closure and exclusion not effective. The outbreak subsided after 11 weeks, apparently independently of all the public health measures that had been taken.	Comments: *Diarrhea was the most common symptom in 57% of the patients, followed by vomiting (31%), nausea (23%), abdominal cramps (8%), and fever (5%), and many patients had more than one symptom Limitations: *The 24 positive stools included 5 from adult staff *Only one sample per person during the 8-day window *The method and population for estimating the incubation period was not reported (e.g. based on only calicivirus positive patients, or all patients with gastroenteritis, or all patients with gastroenteritis except if another pathogen was isolated)
EIA: enzyme immunoassay; HCV: human calicivirus; NR: not reported	

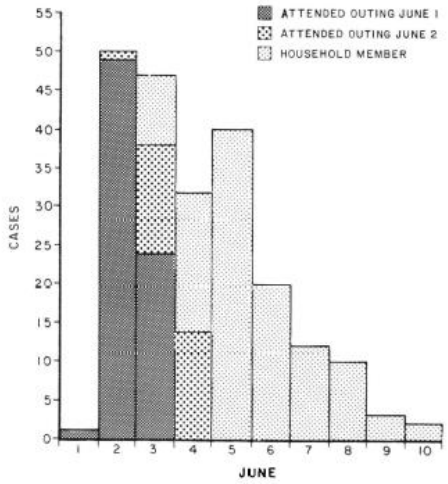
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Guest Journal: Pediatrics Pub Year: 1987 Aim: To describe an outbreak of foodborne snow mountain agent gastroenteritis in a school cafeteria.	Country: United States Study design: Outbreak investigation Study period & duration: Exposure on November 13-15, 1984, investigation up to November 20, 1984	Setting: School Source population: Random sample of 12 classrooms from a school in Brooklyn, New York, United States Inclusion criteria: *All students on the roll for selected classes *Report of symptoms via questionnaire sufficient for judging whether or not illness occurred and the time of its onset *People defined as exposed if they had eaten food served in the cafeteria on ≥1 day from November 13-15; incubation period only reported for those who ate in cafeteria on November 13. *Gastroenteritis Sample: *Questionnaires sent to all students in selected classes. n=432 (92%) respondents; of which n=375 sufficient; of which n=129 (34%) met the case definition. Number of students who ate in cafeteria on November 13 NR. *Age: high school students *Gender: NR	Disease/infectious agent: Norwalk virus Source: French fries and hamburgers served at the school cafeteria Case definition: *Gastroenteritis defined as vomiting (at least once) or diarrhea (≥2 loose stools per day on ≥1 days) in the week of November 13-20, 1984; or clinical symptoms and *Laboratory-confirmed Snow Mountain Agent infection Sampling (specimen, frequency, duration): *Serum collected 7 days after start of outbreak *NA Lab method: Blocking ELISA
Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: November 13 to time of illness onset Results: Range: 0-45 hours; mean 26 hours			Comments: NR Limitations: *Age of students NR
ELISA: enzyme-linked immuno sorbent assay; NR: not reported			

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Hoebe Journal: J Infect Dis Pub Year: 2004 Aim: To estimate the magnitude of the norovirus outbreak and identify its source.	Country: Netherlands Study design: Outbreak investigation Study period & duration: June 2002	Setting: Primary schools Source population: School children on outing to playground with recreational fountain Inclusion criteria: *Visited playground *Children who returned questionnaires *Developed diarrhea within 72 hours after visit Sample: *n=90 primary cases *Mean (± SD) age of school children: 9.2 (± 1.5) yrs; range: 4-12 yrs *M/F-ratio: 47%/53%	Disease/infectious agent: Norovirus genotype Birmingham Source: Water from a recreational fountain Case definition: *Primary case: illness in those who had visited the playground and who had developed diarrhea (≥3 loose stools in any 24 hour period) or vomiting (at least 1 episode) or both within 72 hour after the visit; or clinical symptoms and *Laboratory-confirmation for norovirus Sampling (specimen, frequency, duration): *Stools *Once, 3-6 days after the playground visit Lab Method: RT-PCR was used to test for calicivirus using primers JV12Y/JV131 and NVp110 and JV12BH

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: The intervals between the visit and the onset of symptoms; with a maximum of 72 hours (see case definition) Results: *Range: 7-72 hours *Mean: 30 hours	Comments: *Fountain water was positive for norovirus. Limitations: *Not all cases were laboratory confirmed. Stool specimens were available from 25 children (22 were positive of norovirus) and 16 children without symptoms of diarrhea and/or vomiting (6 were positive of norovirus). *The maximum incubation time was 72 hours by definition

M/F-ratio: male-to-female ratio; RT-PCR: reverse transcription polymerase chain reaction; SD: standard deviation; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Kappus Journal: Am J Epidemiol Pub Year: 1982 Aim: To investigate an outbreak of gastroenteritis after a school outing.	Country: United States Study design: Outbreak investigation Study period & duration: Two days of swimming (June 1st and 2nd 1977) and subsequent outbreak period	Setting: Swimming pool Source population: Elementary school children on an outing and their families, in Kettering, Ohio Inclusion criteria: *Fulfilled the case definition *Attended outing on June 1 or June 2 Sample: *Primary cases at school: n=103; Secondary cases at school: n=9 (and n=117 secondary cases among household members) *Age among school cases: children from fourth and fifth level homerooms *Gender: NR	Disease/infectious agent: Norwalk virus (or closely related virus) Source: Swimming pool Case definition: *Acute illness with either vomiting or diarrhea or with at least two of the following: fever, abdominal cramping, or nausea *Primary case: onset within 48 hrs of attending a class outing; *Secondary: onset outside this period Sampling (specimen, frequency, duration): *Stool and throat washings *NA Lab Method: Stool and throat washings were inoculated into cell cultures and examined by immunoelectron microscopy; urine samples were examined by direct microscopy; Paired sera were examined for antibody to the Norwalk virus by radioimmunoassay

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: Time between swimming (either on June 1 or June 2) and onset of acute gastroenteritis Results: *Range: 0-2 days *Median: 1 day (Numbers read from figure by Pallas)	*Figure. Gastroenteritis cases, by dates of onset  	Comments: *Only strong indication for Norwalk virus from serologic results (fourfold or greater rise in Norwalk antigen, and no other microagents identified); no positive stool samples, but samples were not collected until 3-6 days after onset Limitations: *Maximum incubation period was 2 days by definition; n=9 children had onset of symptoms >2 days after outing *Serial interval in household members peaked 2-3 days after the primary cases and declined steadily thereafter during the period covered by the questionnaire (range 0-5 days (possibly 5 was the maximum number of days covered by the questionnaire); median 2 days)

NA: not applicable; NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Kirkwood Journal: J Clin Virol Pub Year: 2008 Aim: To investigate the duration of virus shedding after diarrhoeal illness in children.	Country: Australia Study design: Case series, longitudinal Study period & duration: 1984-1985, all children under surveillance for 18-36 months	Setting: Hospital Source population: Children admitted to the infectious disease ward of the Royal Children's Hospital (Melbourne, Australia) with acute rotavirus diarrhoea and kept under surveillance for 18-36 months Inclusion criteria: *Having at least one episode of calicivirus diarrhoea Sample: *n=15 children studied, of whom n=8 developed calicivirus infections; shedding data based on n=6 *Age range: 2-20 months *Gender: NR	Disease/infectious agent: Norovirus GII.4 and GII.6 Case definition: *Presence of calicivirus in stools Sampling (specimen, frequency, duration): *Stool *Weekly collection through surveillance and additional sampling during and after diarrhoea (n=270 samples, for the n=15 children studied) Lab Method: RT-PCR

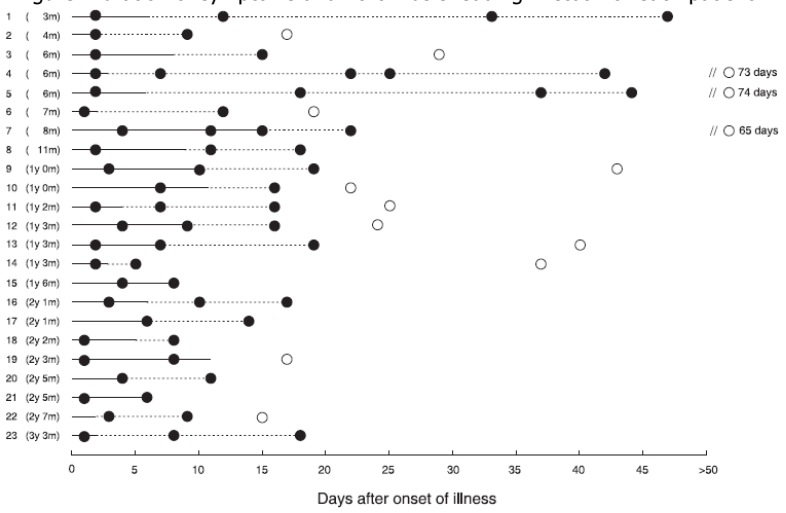
Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Duration of virus isolation after disease onset Results: Based on children with only one norovirus infection: *Range 2-38 after disease onset *Median 11.5 days after disease onset	Comments: *Data for two additional children: -n=1 had sapovirus (shedding 9 days) -n=1 had 4 episodes of diarrhoea: one sapovirus (shedding 8 days), three norovirus (2x GII.4 and 1x GII.6; shedding resp. 100, 70 and 11 days) Limitations: NR

NR: not reported; RT-PCR: reverse transcription polymerase chain reaction

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Marks Journal: Epidemiol Infect Pub Year: 2003 Aim: To investigate the importance of vomiting as a mode of transmission of NLV, and the likelihood that environmental contamination played a role in the spread of the outbreak.	Country: United Kingdom Study design: Outbreak investigation (retrospective) Study period & duration: Outbreak started June 25, 2001. School closed from days 18-21 (inclusive) of outbreak, questionnaire on day 22 of outbreak	Setting: Primary school and nursery Source population: All children attending the primary school and nursery Inclusion criteria: *Recorded to be absent because of gastrointestinal symptoms compatible with NLV infection (diarrhoea, vomiting or abdominal pain) Sample: *n=186 pupils in 15 classrooms, of which 1 was suitable for calculation of incubation period with 17/24 infected *Age of pupils at the school: <12 yrs *Gender: NR	Disease/infectious agent: NLV (closely related to viruses in the Melksham virus cluster) Source: Infected classmates Case definition: 1. Those who reported either diarrhoea or vomiting or both from June 25 to July 16, 2001 inclusive (for those who returned a questionnaire) 2. Those who were absent from school with symptoms compatible with NLV infection from June 25 to July 16, 2001 inclusive (for those who did not return a questionnaire) Or one of the both and laboratory-confirmation Sampling (specimen, frequency, duration): *Stools *NA Lab method: SPIEM, EIA, RT-PCR
Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: Time from exposure to onset of illness Results: Median: 1 day; mean (± SD): 1.5 day (± 1.1) Exclusion period: School closure for 4 days, from day 18 - 21 of outbreak (including cleaning using chlorine-based agents) Results: Outbreak stopped			Comments: *Environmental contamination played a role in spread of the outbreak Limitations: *Only n=7 faecal specimens were analysed *Only 1 classroom was suitable for use in calculation of incubation period

EIA: enzyme immuno assay; NLV: Norwalk-like virus; NR: not reported; RT-PCR: reverse transcription polymerase chain reaction; SD: standard deviation; SPIEM: solid phase electron microscopy; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Murata Journal: Pediatr Infect Dis J Pub Year: 2007 Aim: To describe the clinical features of norovirus-infected children who visited a pediatric clinic and investigate the period of norovirus shedding in their fecal specimens.	Country: Japan Study design: Case series Study period & duration: November 1, 2002 to December 31, 2002	Setting: Pediatric clinic Source population: Children attending the Katsushima Pediatric Clinic, in Yamagata City Inclusion criteria: *Acute gastroenteritis Sample: *n=171 children with acute gastroenteritis; of whom n=71 were positive for norovirus; of whom n=23 were followed-up for shedding *Among n=23 children, age range: 3 months to 3 yr 3 months; median: 1 yr 3 months *M/F-ratio among all children with norovirus gastroenteritis: 45/26	Disease/infectious agent: Norovirus Case definition: *Acute gastroenteritis (presence of either diarrhea or vomiting at presentation); and *Laboratory-confirmed norovirus infection Sampling (specimen, frequency, duration): *Stools *At presentation, and patients were followed as outpatients and asked to submit follow-up fecal specimens without a specified follow-up period (n=26 (of which n=3 positive only on first sample), of the remaining n=23, median number of samples 3, range: 2-6) Lab Method: RT-PCR

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Days from onset of illness until the day that the last positive sample was obtained. Results: *Range: 5-47 days from onset of illness, +3 patients (all aged ≤6 months) shed NV for more than 42, 44 and 47 days *Median: 16 days from onset of illness *Median among patients ≤6 months: 42 days from onset of illness; median among patients >1 yr: 10 days from onset of illness (p=0.0475) *NV was detected >2 weeks after onset in 75% (6/8) of patients <1 yr , 71.4% (5/7) of patients aged 1 yr, and 25% (2/8) of patients aged 2-3 yrs	*Figure. Duration of symptoms and norovirus shedding in stool for each patient.  	Comments: *Of the 5 patients ≤6 months of age, 3 shed NV for an extremely long period (more than 47, 42 and 44 days, respectively); however they did not show any signs of symptomatic gastroenteritis during postrecovery period Limitations: *3 patients were excluded from the shedding analysis as they only their first sample was positive; this might introduce a bias against those who shed for shorter periods of time

M/F-ratio: male-to-female ratio; NR: not reported; NV: norovirus; RT-PCR: real time polymerase chain reaction; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Rockx Journal: CID Pub Year: 2002 Aim: To describe the natural history of NLV (Norwalk-like virus) and SLV (Sapporo-like virus) in humans.	Country: The Netherlands Study design: Community based prospective cohort study with a nested case-control design Study period & duration: Two consecutive cohorts, 6 months each. Date NR	Setting: General Practice Source population: Patients from the general practice network of The Netherlands Institute of Primary Health Care Inclusion criteria: *Fulfilled the case definition of gastroenteritis during follow-up *NLV detected in the first or second stool sample *Complete medical diaries on symptoms Exclusion criteria: *Dual infection Sample: *n=99 infected cases, of whom n=89 had follow-up data *Age categories of cases with follow-up data: <1 yr: n=34 1-4 yrs: n=33 5-11 yrs: n=16 ≥12 yrs: n=6 *Gender: NR	Disease/infectious agent: NLV Case definition: *Gastroenteritis (3 loose stools in 24 h, vomiting 3 times in 24 h, loose stool with 2 additional symptoms, or vomiting with 2 additional symptoms); and *Detection of NLV in stool Sampling (specimen, frequency, duration): *Stools *Collected on days 1, 8, 15, 22 after onset of symptoms Lab method: RT-PCR

Outcome definition, results	Comments, limitations

Outcome definition:
Duration of shedding: Days of shedding calculated from day 1 after onset of symptoms

Results:

*Table. Duration of NLV shedding stool, according to age group

	% of patients* with NLV by age group (years)				
Shedding by day after onset of symptoms	<1 (n=34)	1-4 (n=33)	5-11 (n=16)	≥12 (n=6)	Overall
1	74	88	62	83	78
8	50	44	38	16	43
15	47	32	19	-	34
22	38	22	19	-	26
Day 8 up to day 22 (14 days), but not on day 1					10

*% read from graph by Pallas

Comments:
*Not al NLV cases were initially detected

Limitations:
*Part of cases was aged ≥12 yrs, maximum age not reported
*Duration of NLV shedding may be even longer, but samples were not available from later in the course of infection

NLV: Norwalk-like virus; NR: not reported; RT-PCR: reverse-transcriptase polymerase chain reaction; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Rockx Journal: CID Pub Year: 2002 Aim: To describe the natural history of NLV (Norwalk-like virus) and SLV (Sapporo-like virus) in humans.	Country: The Netherlands Study design: Community based prospective cohort study with a nested case-control design Study period & duration: Two consecutive cohorts, 6 months each. Date NR	Setting: General Practice Source population: Patients from the general practice network of The Netherlands Institute of Primary Health Care Inclusion criteria: *Fulfilled the case definition of gastroenteritis *SLV detected in the first or second stool sample *Complete medical diaries on symptoms Exclusion criteria: *Dual infection Sample: *Total population of SLV-infected cases of n=40 cases who met the case definition, of whom n=36 had follow-up data *Age categories of cases with follow-up data: <1 yr: n=15 1-4 yrs: n=19 5-11 yrs: n=2 *Gender: NR	Disease/infectious agent: SLV Case definition: *Gastroenteritis (3 loose stools in 24 h, vomiting 3 times in 24 h, loose stool with 2 additional symptoms, or vomiting with 2 additional symptoms); and *Detection of SLV in stool Sampling (specimen, frequency, duration): *Stools *Collected on days 1, 8, 15, 22 after onset of symptoms Lab method: RT-PCR

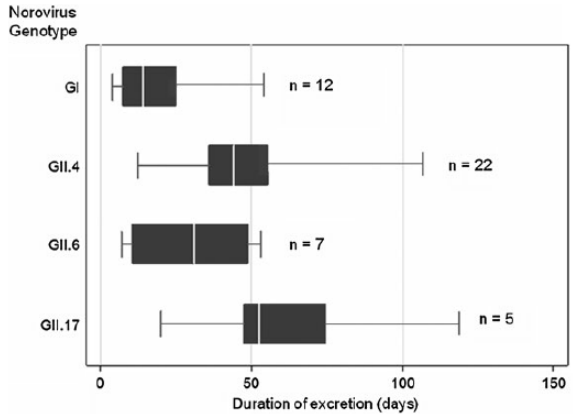
Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Days of shedding calculated from day 1 after onset of symptoms Results: *Table. Duration of SLV shedding in stool, according to age-group	Comments: *Not al SLV cases were initially detected Limitations: NR

	% of patients* with NLV by age group (years)			
Shedding by day after onset of symptoms	<1 (n=15)	1-4 (n=19)	5-11 (n=2)	Overall
1	92	88	50	89
8	61	63	-	58
15	12	15	-	114
22	-	-	-	-

*% read from graph by Pallas

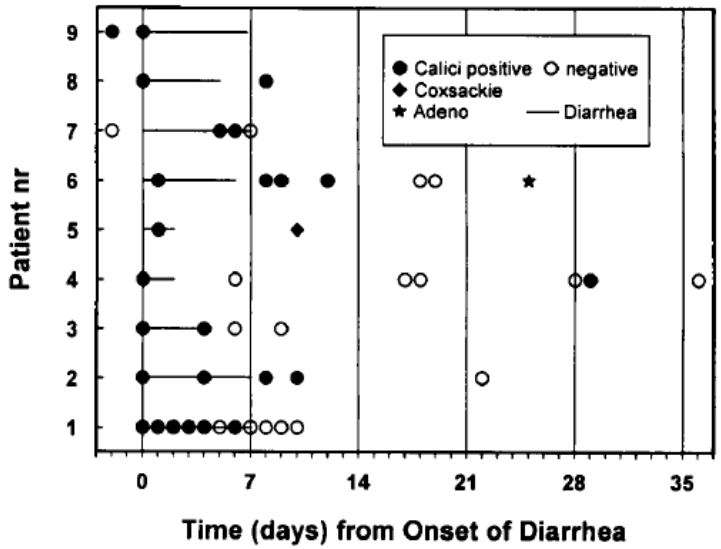
NR: not reported; RT-PCR: reverse-transcriptase polymerase chain reaction; SLV: Sapporo-like virus; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Saito Journal: CID Pub Year: 2014 Aim: To investigate norovirus incidence, determinants of norovirus diarrhea, excretion duration, and evidence for protection from subsequent infection.	Country: Peru Study design: Prospective observational study Study period & duration: June 2007 to April 2011. Follow-up until 2 yrs of life	Setting: A shantytown in southern Lima Source population: Pregnant women and those with newborns <3 months living in Las Pampas de San Juan de Miraflores, randomly selected from a complete community census Inclusion criteria: *Norovirus-positive *Diarrhea Exclusion criteria: *Hospitalisation for >1 month at birth *Any congenital defect *Twin birth *Birth weight <1500 g Sample: *n=291 *Norovirus* infections associated with diarrhea; data available for duration of excretion in n=24 episodes *Median age on day of inclusion, of all cases: 19 days (range: 0-97 days) *Gender: NR	Disease/infectious agent: Norovirus-GI (21.8%), norovirus-GII (76.7%), norovirus-GI/GII (1.5%) Case definition: *Diarrhea (presence of ≥3 liquid or semiliquid stools in 24 hours. If aged <2 months, diarrhea assessed by the mother or caretaker); and *Detection of norovirus in stool Sampling (specimen, frequency, duration): *Stools *Weekly after inclusion in the birth cohort *Children followed to 2 yrs of age Lab method: RT-PCR

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Days between first positive until last positive specimens Results: Median days of shedding from first positive specimen: 31.5 days (Numbers were extracted from a figure by Pallas)	Figure. Duration of norovirus shedding by real-time reverse transcription polymerase chain reaction in 46 randomly selected infection episodes. The boxes represent 25th percentile, median, and 75th percentile, and the whiskers show the minimum and maximum duration of shedding in days. 	Comments: *Because of the long excretion period, included stringent requirements were defined for the end of infection episodes and associations with diarrhea *At day 5, significant less patients from the treatment group (probiotics) shed norovirus compared to the placebo group Limitations: *10% of all diarrheal cases infected with norovirus were children aged 0-2 months

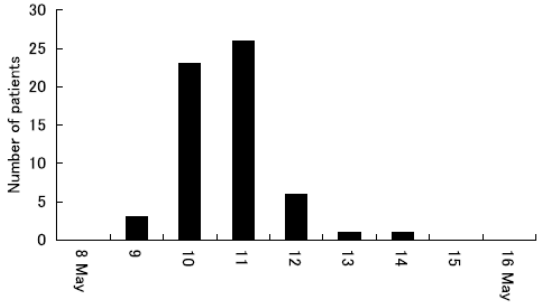
NR: not reported; RT-PCR: real time polymerase chain reaction; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Struve Journal: Pediatr Infect Dis J Pub Year: 1994 Aim: To present an epidemiologic investigation among patients, staff and family members during an outbreak of calicivirus infection.	Country: Sweden Study design: Outbreak investigation, retrospective Study period & duration: 1987 to 1992	Setting: Hospital Source population: Hospitalized children at St. Göran's Children's Hospital, Stockholm, Sweden Inclusion criteria: *Nosocomial calicivirus diarrhea Sample: *n=25 children with nosocomial diarrhea, of whom n=9 were sampled repeatedly, of whom n=7 had had at least one negative sample after positive samples *Among all children with nosocomial diarrhea, median age: 11 months; range 3-23 months *Among all children with nosocomial diarrhea, M/F-ratio: 15/10	Disease/infectious agent: Calicivirus Case definition: *Nosocomial gastroenteritis: onset of diarrhea and/or vomiting began at least 72 hours after admission or within 72 hours of discharge (diarrhea defined as increase in stool frequency to more than 2 per 24 hours and/or change to a looser consistency of stools); and *Positive stool sample for calicivirus in patients with nosocomial diarrhea Sampling (specimen, frequency, duration): *Stools *2 to 11 times *For 38 days Lab method: Negative contrast EM ("star of David")

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Time in days from onset of diarrhea up to last positive sample before two negative samples (n=4) or before first negative sample (n=2). (Definition by Pallas) Results: Range: 0 to 12 days from onset of diarrhea (Numbers read from figure by Pallas)	*Figure. Results of virus detection in repeated fecal samples from cases of nosocomial calicivirus diarrhea.  	Comments: *In two patients other viruses were also detected (adenovirus, coxsackie virus) which might have similar symptoms to calicivirus *2 patients had stool samples 2 days before onset of diarrhea, of which one was found to be positive for calicivirus Limitations: *Study in already hospitalized children might not be representative of healthy children (none of the infected children received immunosuppressive therapy; no further information on reason for hospitalisation) *Duration between last positive and first negative sample ranged from 1 day to 12 days

EM: electron microscopy; M/F-ratio: male-to-female ratio

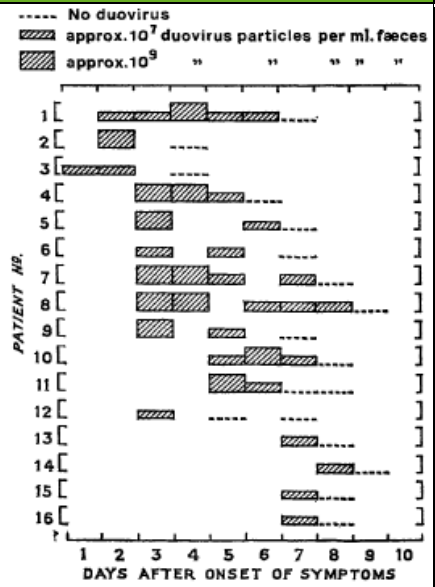
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Usuku Journal: Jpn J Infect Dis Pub Year: 2008 Aim: To describe a food-borne outbreak of gastroenteritis associated with sapovirus GIV strain among junior high school students during and after a study trip.	Country: Japan Study design: Outbreak investigation Study period & duration: May 2007	Setting: Junior high school Source population: 137 people (123 3rd graders, 11 teachers, 1 cameraman and 2 attendants) who went on a study trip to Nara and Kyoto, from 8-10 May, 2007 Inclusion criteria: *Attended study trip *Fell ill Sample: *n=65 cases, of whom n=60 junior high school students and n= 5 adults. *Age: Junior high school students and adults *M/F-ratio: 32/33	Disease/infectious agent: Human sapovirus genogroup IV strain Source: Contaminated food at a hotel restaurant Case definition: *Exhibiting one or more symptoms, including nausea, vomiting, abdominal pain and/or diarrhea, and vomiting and/or diarrhea, in addition to gastroenteritis; or clinical symptoms and *Laboratory-confirmed sapovirus infection Sampling (specimen, frequency, duration): *Stool *NA Lab Method: RT-PCR and sequence analysis

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: The interval between exposure (either dinner on May 8 or breakfast on May 9) and onset of gastroenteritis (definition by Pallas) Results: *Incubation period assuming exposure on May 8 (dinner): 1-6 days (median: 3 days) (calculated by Pallas based on numbers read from figure) *Incubation period assuming exposure on May 9 (breakfast): 0-5 days (median: 2 days) (calculated by Pallas based on numbers read from figure)	*Figure. Onset of gastroenteritis in 65 patients from May 9-14, 2007  	Comments: *33/33 stools from patients were positive for SaV by real-time RT-PCR. 1 among 4 food handlers in the hotel was positive. *Epidemic curve shows one peak, and has a pattern characteristic of a single-exposure, common-vehicle outbreak Limitations: *5 adult cases were included *Exact time of exposure uncertain (dinner May 8 or breakfast May 9)

M/F-ratio: male-to-female ratio; NA: not applicable; RT-PCR: real time polymerase chain reaction; SaV: sapovirus

Gastroenteritis by rotavirus (n=12)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Davidson Journal: Lancet Pub Year: 1975 Aim: To describe a survey of the etiology of sporadic acute enteritis in children in Melbourne during 12 months from November 1, 1973.	Country: Australia Study design: Case series Study period & duration: 12 months, starting November 1, 1973	Setting: Hospital Source population: Children admitted to Royal Children's Hospital, Melbourne Inclusion criteria: *Admitted with acute enteritis *For incubation period: acquired infection in hospital *For duration of shedding: remained in hospital for some time ("later specimens were collected from some patients with enteritis while they remained in hospital") Sample: *For incubation period: 116 hospitalized children in the 'control group' (without acute enteritis and no duovirus infection in specimens of feces obtained within 24 hours of admission to hospital); n=25 children developed symptoms of acute enteritis whilst in hospital; n=22 showed duovirus particles in stool extracts *Age range: 10 days to 12.5 yrs *M/F-ratio: 209/169 *For duration of shedding: n=378 children with acute enteritis; n=197 with duovirus infection; n=16were followed during their stay in hospital *Age range: 10 days to 6 yrs *M/F-ratio: 68/47	Disease/infectious agent: Rotavirus Source: NR, but probably infected children in hospital Case definition: *Acute enteritis: febrile illness <10 day's duration, associated with diarrhoea, with or without vomiting; and *Duovirus particles in stool extracts Sampling (specimen, frequency, duration): For incubation period: *Stools *NA For duration of shedding: *<24 after admission, and regularly during hospital stay, until negative sample Lab Method: Culture and standard isolation techniques; EM

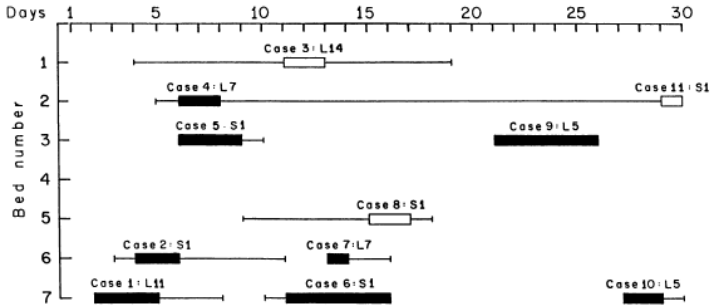
Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: Based on time from hospital admission to onset of acute enteritis Duration of shedding: Time from onset of symptoms to last positive sample before negative stool sample (definition by Pallas) Results: Incubation period: <48 hours Duration of shedding: *Range: 2 to 8 days from hospital admission *Median: 6 days from hospital admission (Number read from figure by Pallas)	*Figure. Duration and degree of duovirus excretion in feces from 16 children with acute enteritis		Comments: *Duovirus = rotavirus Limitations: *For incubation period: study in hospitalized children
EM: electron microscopy; M/F-ratio: male-to-female ratio; yrs: years			

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Gaggero Journal: J Clin Microbiol Pub Year: 1992 Aim: Using electropherotyping of RV as a means of comparing the genomes of clinical isolates to trace nosocomial RV transmission in a pediatric ward designated for diarrheal diseases in Santiago, Chile.	Country: Chile Study design: Case series Study period & duration: July 1985 to July 1987	Setting: Hospital Source population: Infants and children hospitalized in the ward at the Roberto del Río Children's Hospital, Santiago Inclusion criteria: *Hospitalized for acute diarrhea *<2 yrs of age Sample: *n=315 children identified with RV; data is available for n=11 patients from the study room during 1 month *Age of all cases: 0-2 yrs *Gender: NR	Disease/infectious agent: Rotavirus Case definition: *Acute diarrhea; and *RV detected in stool Sampling (specimen, frequency, duration): *Stools *Every other day during entire hospital stay. Daily sampling when positive case *Monitored until three consecutive specimens gave negative results Lab method: RNA electrophoresis screening

<table>
<tr><th>Outcome definition, results</th><th></th><th>Comments, limitations</th></tr>
<tr>
<td>Outcome definition:
Duration of shedding: From detection in stool (upon admission or nosocomially acquired) until three consecutive negative specimens

Results:
Range: 1-5 days; mean: 2.5 days (Calculated by Pallas)

*Table. Number of days from detection in stool until 3 consecutive negative specimens, by individual case
<table>
<tr><th>Individual results</th><th>Number of days</th></tr>
<tr><td>Case 1</td><td>2</td></tr>
<tr><td>Case 2</td><td>2</td></tr>
<tr><td>Case 3</td><td>1</td></tr>
<tr><td>Case 4</td><td>3</td></tr>
<tr><td>Case 5</td><td>5</td></tr>
<tr><td>Case 6</td><td>2</td></tr>
<tr><td>Case 7</td><td>2</td></tr>
<tr><td>Case 8</td><td>1</td></tr>
<tr><td>Case 9</td><td>3</td></tr>
<tr><td>Case 10</td><td>5</td></tr>
<tr><td>Case 11</td><td>2</td></tr>
</table>
(Number of days read from figure by Pallas)</td>
<td>Figure: Temporal distribution of positive RV cases and their electropherotypes (shown in Fig. 1), isolated from patients admitted to one study room with seven beds during 1 month. Each line corresponds to the total hospitalisation period of a single positive case. Black and white blocks represent the RV shedding period of community- and hospital-acquired infections, respectively. The case number and corresponding electropherotype are specified over the blocks. The bed occupancy rate was over 85%, but cases without RV detection are not included in the figure.

 
</td>
<td>Comments:

NR

Limitations:
*8/11 cases were diagnosed upon admission, 3/11 patients are hospital-acquired infections (RV shed beyond the third day after admission). For the eight cases diagnosed upon admission, duration of diarrhea before admission to the hospital was unknown
*Start of measurement of duration of shedding was not at time of onset for all cases</td>
</tr>
<tr><td colspan="3">NR: not reported; RNA: ribonucleic acid; RV: rotavirus; Yrs: years.</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Guarino Journal: Pediatrics Pub Year: 1994 Aim: To see whether oral administration of immunoglobulin might be effective in the treatment of acute rotaviral gastroenteritis.	Country: NR (probably Italy) Study design: Prospective, double-blind, placebo-controlled study Study period & duration: October 1991 to February 1993	Setting: Hospital Source population: Children admitted to the hospital Inclusion criteria: *Admitted because of acute diarrhea *Acute rotavirus gastroenteritis Exclusion criteria: *Administration of antibiotics within the previous 3 weeks *Onset of symptoms more than 72 hours before admission *Weight-height ratio below the 5th percentile *Medication other than rehydration therapy during the course of the illness *Vomiting after administration of oral immunoglobulin Sample: *Total study population of n=71 patients of whom n=35 in the control group *Mean age (± SD) of control group: 15 months (± 7) *Gender of control group: 51% male	Disease/infectious agent: Rotavirus Case definition: *Diarrhea (unequivocally increased frequency or diminished consistency of stools in comparison with the previous normal pattern); and *RV detected in stool Sampling (specimen, frequency, duration): *Stools *All stools during hospitalisation (h *Duration of sampling: NR, the patients' parents were requested to collect all fecal samples after the discharge from the hospital Lab method: Rotazyme, Abbott Laboratories, Rome

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From the first loose stool after admission to the hospital until first of two negative consecutive stools Results: Mean (95% CI) duration of shedding from the first loose stool: 179 hours (162.7-195.3) Mean duration of shedding after correction for covariates (age, body weight, duration of diarrhea before treatment): 181.3 hours	Comments: *Mean duration of diarrhea before the admission was 45 hours (95% CI: 38.70 to 51.40) *Total duration of rotaviral diarrhea, duration of viral excretion and hospital stay was significant reduced in the treated group (human serum immunoglobulin) *Hospital stay was protracted for 24 hours after recovery from diarrhea, to be sure no relapses occurred and to collect further fecal samples Limitations: *Therapy for diarrhea included sodium bicarbonate and glucose-electrolyte solution only

CI: confidence interval; NR: not reported; RV: rotavirus; SD: standard deviation.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Hilpert Journal: J Inf Dis Pub Year: 1987 Aim: To describe a bovine milk concentrate containing antibody to human rotavirus and its efficiency in treating infantile rotavirus gastroenteritis.	Country: Germany Study design: Controlled trial Study period & duration: Winters of 1982 to 1983, 1983 to 1984 and 1984 to 1986	Setting: Hospital Source population: Infants who had been admitted to the University Children's Hospital in Bochum Inclusion criteria: *>2 yrs *Acute gastroenteritis *Infants with two consecutive stool samples positive for rotavirus and negative for enteropathogenic bacteria in stools after hospitalisation Sample: *Total study population of n=164, of whom n=89 assigned to control group 1982-1983: n=22 1983-1984: n=24 1984-1986: n=43 *Age all cases: 0-2 yrs *Gender: NR	Disease/infectious agent: Rotavirus Case definition: *Acute gastroenteritis; and *Positive stool sample for rotavirus Sampling (specimen, frequency, duration): *Stools *Two stools samples as soon as possible after hospital admission, thereafter on daily basis *Up to the 12th day after admission or until at least two consecutive negative samples were detected in the same patient Lab method: ELISA test kit

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From admission to the hospital until at least two consecutive negative samples Results: Mean (± SE:) duration of shedding from admission to the hospital 1982-1983: 3.91 days (± 0.51) 1983-1984: 3.58 days (± 0.48) 1984-1986: 5.02 days (± 0.29)	Comments: *Treatment of diarrhea was identical in both groups and consisted of oral or parenteral rehydration, a dietary regimen with cooked-carrot preparations on the first day, and a stepwise reintroduction of a commercial infant formula *Days of excretion of the virus did not significantly differ between the controlled and treated (milk immunoglobulins prepared from rotavirus-hyperimmunized cows) groups when treated with concentrate A (neutralisation titer of 10% solution, 1:330) or concentrate B (neutralisation titer of 10% solution, 1:1,100). In children treated with concentrate C (neutralisation titer of 10% solution, 1:6,000), virus was excreted less days during hospitalisation Limitations: *Duration of diarrhea before hospitalisation unknown *Duration of shedding not measured from time of onset of symptoms

ELISA: enzyme-linked immuno sorbent assay; SE: standard error.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Mukhopadhya Journal: J Med Virol Pub Year: 2013 Aim: To study the pattern of rotavirus shedding.	Country: India Study design: Case series, data collected from ongoing rotavirus birth cohort study Study period & duration: 60 days	Setting: Hospital Source population: Children admitted to the Christian Medical College in Vellore Inclusion criteria: *Diarrhea positive for *Rotavirus* *<5 yrs of age Sample: *n=10 *Median age: 8 months (IQR: 6.5-11.0 months) *60% male	Disease/infectious agent: Rotavirus G2P[4] (n=5), rotavirus G1P[8] (n=4), rotavirus G9P[UT] (n=1) Case definition: *Diarrhea; and *Positive stool sample for rotavirus Sampling (specimen, frequency, duration): *Stools *Daily *Maximum of 60 days after recruitment Lab method: ELISA and RT-PCR

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From onset of symptoms, endpoint NR Results: Days of shedding from onset of symptoms Range: 14-51 days; median: 24 days; IQR: 22-31 days	Comments: *All children admitted to the hospital received standard care for the management of diarrhea (IV fluids and oral rehydration solution or oral rehydration solution alone) Limitations: *One child had an additional diagnosis of acyanotic heart disease, another with exanthematous fever in addition to the diarrhea *Pallas assumed that duration of shedding was measured from onset of symptoms, but this was not obvious stated in the article *No definition of the endpoint of shedding (e.g. 2 consecutive negative cultures) was given

e.g.: exempli gratia; ELISA: enzyme-linked immunosorbent assay; IQR: Interquartile range; IV: intravenous; NR: not reported; RT-PCR: real time-polymerase chain reaction; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Pickering Journal: J Pediatr Pub Year: 1988 Aim: To evaluate the duration of excretion of rotavirus from children before and after episodes of diarrhea caused by rotavirus.	Country: United States Study design: Prospective survey Study period & duration: 12 months	Setting: Day care center Source population: Children enrolled at one of 12 selected day care center in Houston, Texas, United States Inclusion criteria: *Consent of owner/director of DCC *Permission from parents of children *Met case definition Sample: *12 DCC, a mean of 234 children were followed; n=94 children; a total of n=99 diarrhea episodes associated with rotavirus identification were analysed *Age: infants and toddlers *Gender: NR	Disease/infectious agent: Rotavirus Case definition: *Diarrhea: loose, frequent stools as determined by the care giver; and *Rotavirus identified in a stool specimen in which another enteropathogen was not found Sampling (specimen, frequency, duration): *Stools *Weekly, additional specimens when gastroenteritis occurred. If rotavirus was identified in a study child during routine or illness testing, additional specimens collected every other day from all children in that child's classroom until rotavirus was no longer identified for 2 consecutive weeks. Lab method: Monoclonal-polyclonal antibody sandwich ELISA

<table>
<tr><th>Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td>Outcome definition:
Duration of shedding: Proportion of rotavirus positive children by number of days (1) before rotavirus diarrhea episode; (2) after cessation of diarrhea

Results:
*Table. Number of rotavirus positive/children tested (% positive [95%CI]) by day before or after cessation of diarrhea
<table>
<tr><th>Day</th><th>Before RV diarrhea</th><th>After cessation of diarrhea</th></tr>
<tr><td>Day 0</td><td>99/99 (100 [-])</td><td>99/99 (100 [-])</td></tr>
<tr><td>Day 1</td><td>10/20 (50 [72-28])</td><td>6/10 (60 [90-30])</td></tr>
<tr><td>Day 2</td><td>4/13 (31 [56-6])</td><td>9/17 (53 [77-29])</td></tr>
<tr><td>Day 3</td><td>1/12 (8 [24-0])</td><td>12/25 (48 [68-28])</td></tr>
<tr><td>Day 4</td><td>1/17 (6 [17-0])</td><td>4/16 (25 [46-4])</td></tr>
<tr><td>Day 5</td><td>2/16 (13 [29-0])</td><td>12/34 (35 [51-19])</td></tr>
<tr><td>Day 6</td><td>0/18 (0 [-])</td><td>2/18 (11 [26-9])</td></tr>
<tr><td>Day 7</td><td>1/25 (4 [12-0])</td><td>4/35 (11 [22-0])</td></tr>
<tr><td>Day 8</td><td>0/10 (0 [-])</td><td>3/24 (12 [26-0])</td></tr>
<tr><td>Day 9</td><td>0/11 (0 [-])</td><td>2/11 (18 [41-0])</td></tr>
<tr><td>Day 10</td><td>0/10 (0 [-])</td><td>4/16 (25 [46-4])</td></tr>
<tr><td>Day 11</td><td>1/9 (11 [32-0])</td><td>2/23 (9 [20-0])</td></tr>
<tr><td>Day 12</td><td>0/8 (0 [-])</td><td>1/21 (5 [14-0])</td></tr>
<tr><td>Day 13</td><td>1/16 (6 [18-0])</td><td>1/23 (4 [13-0])</td></tr>
<tr><td>Day 14</td><td>0/12 (0 [-])</td><td>3/27 (11 [23-0])</td></tr>
</table>
Four continued to excrete RV for 15, 16, 28 and 34 days after their respective diarrhea episodes stopped.</td><td>Comments:
*Each child excreted the same strain during diarrhea as was found before or after diarrhea occurred, indicating that these children, when they were asymptomatic, shed the virus that produced their disease and were not infected with or carrying another strain.
*Whether the general practice of exclusion or isolation of children during the symptomatic phase of RV infection would reduce transmission has not been determined, but it seems likely to do so. Exclusion or isolation of children for a defined period of time after illness is not practical, and identification of children before development of symptoms is impossible. In addition, many other children in the DCC setting may have periods of asymptomatic excretion. Asymptomatic shedding of rotavirus before and after a diarrhea episode, as identified in this study, represents a source of transmission that could best be avoided by appropriate handwashing procedures and diaper disposal after diaper changing.

Limitations:
*Duration of shedding not reported from time of onset of diarrhea
*NR for how long diarrhea lasted</td></tr>
<tr><td colspan="2">CI: confidence interval; DCC: day care center; ELISA: ELISA: enzyme-linked immuno sorbent assay; NR: not reported; RV: rotavirus.</td></tr>
</table>

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr>
<td>Author: Rahman

Journal: Vaccine

Pub Year: 2012

Aim: To evaluate the effect of hyperimmune immunoglobulin Y (IgY) against human rotavirus (HRV) among pediatric patients receiving standard supportive treatment for rotavirus-associated diarrhea mostly with an enteric non-cholera co-pathogen in a hospital setting.</td>
<td>Country: Republic of the Union of Myanmar

Study design: Double-blind, placebo-controlled trial

Study period & duration: January to March 2011</td>
<td>Setting: Hospital

Source population: Infants and children brought to the Pediatric Infectious Disease wards of the Defense Services Obstetrics, Gynaecology and Children's Hospital

Inclusion criteria:
*Aged between 2 and 36 months
*History of acute watery diarrhea and dehydration
*Positive result on the commercial Dipstick 'Eiken' Rota kit for rotavirus antigen

Exclusion criteria:
*Children with severe malnutrition, respiratory infections, systemic infection, a history of bloody or mucoid diarrhea
*Incomplete data

Sample:
*Total study population of n=52 children, of whom n=26 assigned to the placebo group
*Mean (± SD) age of cases in placebo group: 13.5 (± 6.3) months
*M/F-ratio of cases in placebo group: 17/9</td>
<td>Disease/infectious agent: Rotavirus

Case definition:
*History of acute watery diarrhea; and
*Positive result on the commercial Dipstick 'Eiken' Rota kit for rotavirus antigen

Sampling (specimen, frequency, duration):
*Stools
*Daily
*For 8 days

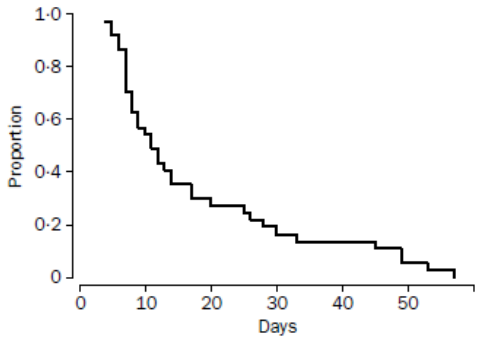
Lab method: ELISA</td>
</tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr>
<td colspan="3">Outcome definition:
Duration of shedding: Status of shedding per day, from day of admission until rotavirus negative stool

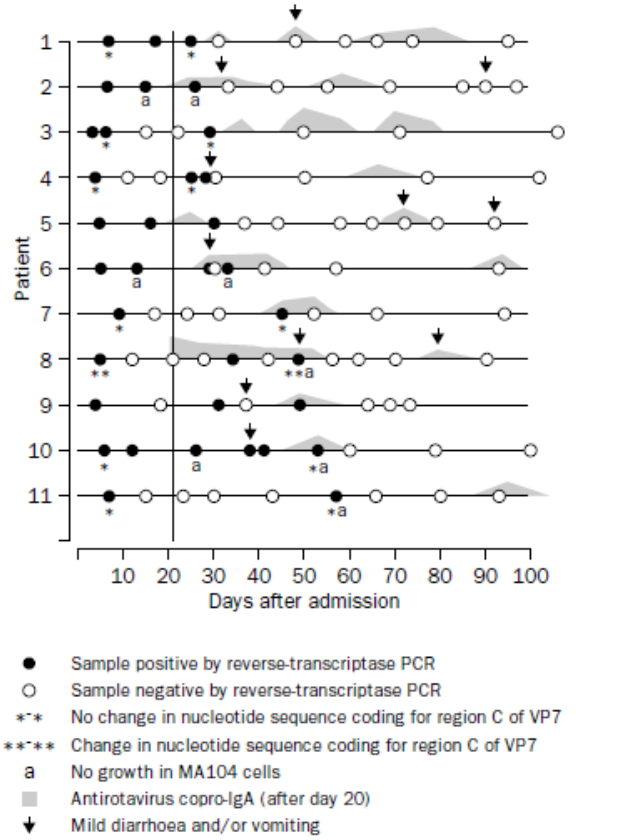
Results:
Mean (± SD) days of shedding from admission to hospital: 4.2 days (± 2.9)

*Table. Daily frequency of viral shedding
<table>
<tr><th>Day from admission to hospital</th><th>% shedding</th></tr>
<tr><td>Day 1</td><td>100%</td></tr>
<tr><td>Day 2</td><td>100%</td></tr>
<tr><td>Day 3</td><td>88%</td></tr>
<tr><td>Day 6</td><td>25%</td></tr>
<tr><td>Day 7</td><td>20%</td></tr>
<tr><td>Day 8</td><td>25%</td></tr>
</table>
</td>
<td>Comments:
*All children were observed for 4 h during which rehydration with oral rehydration fluids or IV-fluids was performed
*Children in the placebo group received one sachet of placebo IgYs four times daily for 8 consecutive days in addition to rehydration therapy
*The mean (± SD) of duration of diarrhea before enrolment in the study was 74.4 hours (± 38.4)
*The treated group (Rotamix IgY) had statistically significant reduction of mean duration of diarrhea from day of admission, and mean duration of rotavirus clearance from stool from day of admission

Limitations:
*All pediatric patients received the usual medical treatment according to the nature of mixed infection as judged by attending physicians (mostly Metronidazole n=23, folic acid n=12, zinc n=10)
*Duration of shedding not measured from time of onset of symptoms</td>
</tr>
<tr><td colspan="4">ELISA: enzyme linked immunosorbent assay; h: hours; IgY: immunoglobulin Y; IV: intravenous; M/F: male/female; SD: standard deviation.</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Richardson Journal: Lancet Pub Year: 1998 Aim: To examine the duration of rotavirus excretion and fluctuations of anti-rotavirus coproIgA in sequential faecal specimens obtained from young children during 100 days after admission to hospital with severe rotavirus diarrhea	Country: Australia Study design: Case series Study period & duration: NR, children were under surveillance for 100 days	Setting: A infectious-diseases ward of the Royal Children's Hospital, Melbourne Source population: Children admitted to the infectious diseases ward of the Royal Children's Hospital, Melbourne Inclusion criteria: *Otherwise healthy admitted for treatment of acute rotavirus diarrhoea *Primary rotavirus infection on the basis of very low or absent rotavirus antibody in serum obtained within 48h of admission, and on the later demonstration of an IgM-class rotavirus serum antibody response Sample: *n=37 children with acute rotavirus diarrhea *Age range: 1-39 months *M/F-ratio: 22/15	Disease/infectious agent: Rotaviruses VP7 serotype (G type): G1 in n=29 children, G4 in n=7 and n=1 with a mixture of G1 and G4; P[8] in n=31, mixed P[6] and P[8] in n=1 child, could not be identified in n=5 Case definition: *Acute rotavirus diarrhea; and *Had very low or absent rotavirus antibody in serum obtained within 48 hours of admission, and later had an IgM-class rotavirus serum antibody response Sampling (specimen, frequency, duration): *Stool *Collected daily for 14 days after admission and weekly thereafter for ≥100 days (roughly 26 specimens per child) Lab Method: Rotavirus was screened by EIA and by amplification of genome double-stranded RNA by RT-PCR. IgA coproantibody was estimated by EIA.

Outcome definition, results			Comments, limitations
Outcome definition: Duration of shedding: Duration of rotavirus excretion after onset of diarrhoea Results: *Range: 4-57 days after onset of diarrhea *Median: 10 days after onset of diarrhea *Detectable excretion ceased within 10 days in 16 (43%) children, between 10-21 days in 10 (27%) children, and between 22-57 days in 11 (30%) children *Excretion was detected intermittently at 14-48 day intervals in 7/11 children who excreted virus for ≥21 days	*Figure. Proportion of 37 children excreting rotavirus relative to days after onset of rotavirus diarrhea  	*Figure. Pattern of rotavirus excretion relative to occurrence of anti-rotavirus coproIgA in children excreting rotavirus for >21 days after onset of severe rotavirus diarrhea (Flat lines from day 21 indicate negative coproIgA and EIA antigen results)	Comments: *Excretion estimation differed between EIA and reverse-transcriptase PCR. The former estimate was shorter: 4-29 days (median: 7 days). *Mild diarrhoea or vomiting or both was found in 8/11 children showing extended rotavirus excretion and 5/26 children in whom excretion had ceased by day 21. There was significant difference in incidence of postdischarge diarrhoea in the two groups (p=0.006) Limitations: NR

EIA: enzyme immunoassay; Ig: immunoglobulin; M/F-ratio: male-to-female ratio; NR: not reported; PCR: polymerase chain reaction

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr>
<td>Author: Rosenfeldt

Journal: Pediatr Infect Dis J

Pub Year: 2002

Aim: To examine the efficacy of a mixture of selected lactobacilli in children hospitalized with acute diarrhea.</td>
<td>Country: Denmark

Study design: Double-blind, placebo-controlled trial

Study period & duration: December 1998 to May 1999</td>
<td>Setting: Hospital

Source population: Children hospitalized at the Pediatric Departments of H:S Hvidovre Hospital and Copenhagen County Hospital in Glostrup

Inclusion criteria:
*Aged between 6 - 35 months
*Hospitalized with acute diarrhea
*Rotavirus-positive

Exclusion criteria:
*Underlying chronic disease
*Prescription of antibiotics during the study period
*Duration of diarrhea of no more than 7 days
*Ingestion of fermented milk products containing live bacteria

Sample:
*Total study population of n=36, of whom n=28 assigned to the control group. Data on viral shedding from day 1 until day 5 available for n=25 children
*Mean age (± SD) of all cases in the control group: 16.7 months (± 13)
*M/F-ratio of all cases in the control group: 24/15</td>
<td>Disease/infectious agent: Rotavirus

Case definition:
*Acute diarrhea (2 or more consecutive loose stools during 24 hours); and
*Rotavirus positive

Sampling (specimen, frequency, duration):
*Stool
*Daily
*Up to 5 days

Lab method: Latex agglutination test using monoclonal antibody for rotavirus detection (Slidex Rota-Kit 2)</td>
</tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr>
<td colspan="3">Outcome definition:
Duration of shedding: Days of shedding calculated from day 1 after inclusion in study

Results:

*Table. Percent distribution of patients excreting rotavirus during the 5-day intervention period
<table>
<tr><th>Days of the intervention</th><th>% of patients* excreting rotavirus (complete data for n=25 patients)</th></tr>
<tr><td>Day 1</td><td>100</td></tr>
<tr><td>Day 2</td><td>81</td></tr>
<tr><td>Day 3</td><td>69</td></tr>
<tr><td>Day 4</td><td>56</td></tr>
<tr><td>Day 5</td><td>46 (12/26 patients)</td></tr>
</table>
(% read from graph by Pallas)</td>
<td>Comments:
*For rehydration, the patients were offered oral rehydration solution. Four patients in the control group received parenteral rehydration
*Mean (± SD) duration of diarrhea before intervention: 72.3 hours (± 45.3)
*In the active treatment group (complete data for n=16), 100%, 70%, 57%, 38% and 13% of the patients were excreting rotavirus on days 1, 2, 3, 4, 5, respectively (% read from graph by Pallas). On day 5 rotavirus was detected in significantly less (2/16) patients from the treatment group (Lactobacillus rhamnosus 19070-2 and Lactobacillus reuteri DSM 12246)(p=0.025)

Limitations:
*An exact measurement of the duration of viral excretion in the two study groups was not known
*Duration of shedding not measured from time of onset of symptoms</td>
</tr>
<tr><td colspan="4">M/F: male/female; SD: standard deviation.</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Sarker Journal: Pediatr Infect Dis J Pub Year: 1998 Aim: To describe the findings of the first double blind placebo-controlled trial with lyophilized antirotavirus immunoglobulin from colostrum of immunized cows to treat children with severe rotavirus diarrhea.	Country: People's Republic of Bangladesh Study design: Double blind placebo-controlled trial Study period & duration: March 1995 to December 1996	Setting: Hospital Source population: Infants and children attending the Clinical Research and Service Centre of the International Centre for Diarrhoeal Disease Research, Bangladesh Inclusion criteria: *Males *Aged 4 to 24 months *History of acute watery diarrhea for <48 hours with some dehydration *Positive ELISA test for rotavirus, a negative dark field examination and a stool rate >20 ml/kg during the observation period (4 hours) *Weight for age >60% of National Centre for Health Statistics Exclusion criteria: *Systemic infections *Marasmus or kwashiorkor Sample: *Total study population n=80, of whom n=40 assigned to the placebo group *Mean (± SD) age of cases in placebo group: 9.8 months (± 3.3) (range 4-24 months) *100% male	Disease/infectious agent: Rotavirus Case definition: *Acute watery diarrhea (passage of four or more loose or watery stool in a 24-h period); and *Positive ELISA test for rotavirus Sampling (specimen, frequency, duration): *Stools *Daily *For 4 days Lab method: ELISA

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From admission to placebo group until rotavirus ELISA-negative stool Results: Mean days of shedding from admission to placebo group: 2.9 days	Comments: *Study was conducted in children with moderate to severe rotavirus diarrhea *Probability of persistence of rotavirus in stools was significantly less in children treated with IIBC than in those treated with the placebo (P=0.001) *Mean (± SD) duration of diarrhea before hospitalisation: 29.3 hours (± 9.6) Limitations: *Duration of shedding not measured from time of onset of symptoms

ELISA: enzyme linked immunosorbent assay; IIBC: immunized bovine colostrum; kg: kilogram; ml: millilitre; SD: standard deviation.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Stals Journal: J Med Virol Pub Year: 1984 Aim: To obtain more information about the role of the IgA throughout the whole period of gastrointestinal symptoms in infants and young children with rotavirus diarrhoea and to study the role of the respiratory route for transmission of rotavirus by determination of rotavirus antigen and IgA in pharyngeal secretions sampled throughout the period of diarrhoea.	Country: The Netherlands Study design: Case series Study period & duration: January 1, 1982 to December 31, 1982	Setting: Hospital Source population: Infants and children hospitalised in a Dutch regional hospital Inclusion criteria: *Hospitalized because of diarrhea *Infected with rotavirus Sample: *n=70 with acute diarrhea, of whom n=31 with confirmed rotavirus infection *Age among those with acute diarrhea: 0-4 yrs *Gender: NR	Disease/infectious agent: Rotavirus Case definition: *Acute diarrhea (less than 8 days at admission) *Rotavirus in faeces Sampling (specimen, frequency, duration): *Stools *Daily *Throughout the period of clinical symptoms. Mean (± SE) number of samples per person: 3.10 (± 0.45); this was 82% of the expected number of samples Lab method: ELISA

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From onset of diarrhea until excretion of rotavirus stopped Results: Shedding during the 7 days after onset of diarrhea: 84% Shedding throughout the period of diarrhea: 68% (mean (± SE) total duration of diarrhea: 6.97 days (± 0.37)) Excretion of virus stopped 2 to 3 days after the cessation of diarrhea	Comments: *Maximal virus shedding occurred from day 2 to day 5 *Enteropathogens (*Salmonella*, *Campylobacter jejuni*) were isolated in stools of n=7 children. In one child *Giardia lamblia* was detected *The results of this study cannot be extrapolated to cases of chronic diarrhoea Limitations: *The method suggest they only examined stool throughout the period of clinical symptoms, but the results gave data for duration excretion after cessation of diarrhea

ELISA: enzyme linked immunosorbent assay; IgA: immunoglobulin A; NR: not reported; SE: standard error; Yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Uhnoo Journal: J Infect Pub Year: 1986 Aim: To examine the relative contributions of viral, bacterial and parasitic agents to enteric illnesses and to describe the patterns of infection among inpatients and outpatients by age, sex and season.	Country: Sweden Study design: Case series Study period & duration: January-December 1981	Setting: Hospital Source population: Children <15 years of age who directly sought medical advice at the Department of Pediatrics of the University Hospital of Uppsala during the study period, or for whom there was telephone consultation. Inclusion criteria: *Acute gastroenteritis *Stool samples available Sample: *416 children with gastroenteritis; of whom n=187 with enteropathogenic rotavirus infection; NR how many the shedding data was based on *Age range among all children with gastroenteritis: 0-15 yrs; 0-12 months, n=77; 13-24 months, n=63; 25-36 months, n=22; >36 months, n=38 *M/F-ratio among all children with gastroenteritis: 112/88	Disease/infectious agent: Rotavirus Case definition: *Acute gastroenteritis (diarrhoea (≥3 loose or watery stools for ≥1 day and for ≤14 days before arrival) with or without vomiting and fever); and *Laboratory-confirmed rotavirus infection Sampling (specimen, frequency, duration): *Stool *Collected from all patients as soon as possible after admission to hospital or after telephone consultation. *From some patients, specimens were collected weekly or every fortnight to investigate duration of pathogen excretion Lab Method: EM, SPIEM, indirect ELISA , standard complement fixation test

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: NR Results: *As long as 30 days after onset of symptoms (by SPIEM) *Rotavirus was found in 35 % of 65 convalescent faecal samples delivered 2-6 weeks after the onset of diarrhoea. *In 8 children, sparse shedding of virus continued for I4-25 days after the diarrhoea had ceased.	Comments: *Rotavirus was detected in 9/17 adults and in 5/7 siblings of patients with rotavirus infections. The mean incubation period was 2.9 days (however this might also be a serial interval) *Prolonged diarrhoea was associated with excretion of the virus in larger amounts. Limitations: *Sampling infrequent *NR how many people were repeatedly sampled

ELISA: enzyme-linked immunosorbent assay; EM: electron microscopy; M/F-ratio: male-to-female ratio; NR: not reported; SPIEM: solid-phase immune electron microscopy

Other viral infections

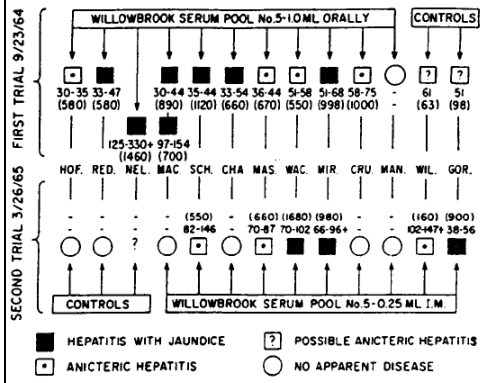
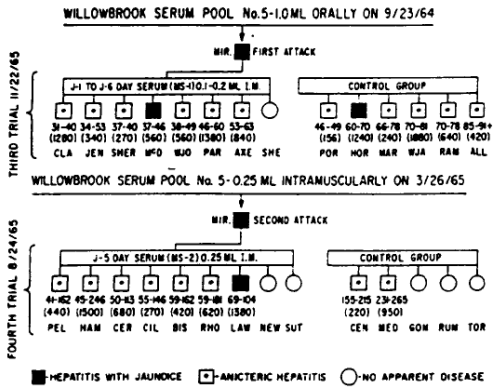
Hepatitis A (n=3)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Brodribb Journal: Lancet Pub Year: 1952 Aim: To describe an outbreak of infective hepatitis in a boarding-school.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: October 1950 to January 1951	Setting: Preparatory school Source population: Staff and pupils at a boys' preparatory school Inclusion criteria: *Part of the school's closed community (boys, adult teaching and nursing staff, adult domestic staff) *Developed symptoms definitely or strongly suggestive of hepatitis Sample: *n=90 people at the school; of whom n=50 developed symptoms definitely or strongly suggestive of hepatitis; of whom n=28 were likely infected by case 1, including two adults *Age among the 50 cases: boys aged 6-15 yrs, n=44; adults aged 19-40 yrs, n=6 *Gender: all children were boys; adults NR	Disease/infectious agent: Hepatitis A Case definition: *Symptoms definitely or strongly suggestive of hepatitis, i.e. jaundice, liver enlarged, pale stools (nearly every case started with one or more of the following: nausea, vomiting, severe anorexia, pain behind the eyes, giddiness, slight fever, or merely a typical slightly greyish pallor) Sampling (specimen, frequency, duration): *NA Lab Method: NA

Outcome definition, results	Comments, limitations
Outcome definition: Serial interval: The interval between onset in case 1 and onset in the first waves of secondary cases (based on onset of early symptoms; not necessarily jaundice) Results: Serial interval: *Range: 20-32 days *Median: 27 days	Comments: NR Limitations: *Serial interval, not incubation period

NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Krugman Journal: JAMA Pub Year: 1967 Aim: To provide evidence for the presence of two distinctive clinical, epidemiological and immunological types of infectious hepatitis.	Country: United States Study design: Series of 7 non-randomized clinical trials with comparison between experimental induced hepatitis and controls (1st and 3rd were about hepatitis A, others about hepatitis B) Study period & duration: September 1964 to January 1967	Setting: Institutional school Source population: Children attending Willowbrook State School for retarded children, New York, Staten Island Inclusion criteria: *Newly admitted children Sample: *Trial 1: n=11 children fed blood serum infected with hepatitis A, of whom n=10 became symptomatic; Trial 3: n=8 children were administered blood serum infected with hepatitis A; of whom n=7 became symptomatic *Age range: 3-10 yrs *Gender: NR	Disease/infectious agent: Hepatitis A Source: Virus isolated from blood serum of other patients Case definition: *Hepatitis with jaundice: the occurrence of clinical jaundice associated with an abnormal serum bilirubin and an abnormal serum glutamic oxalacetic transaminase (SGOT); Hepatitis without jaundice: the serum bilirubin value was less than 1.0 mg/100 ml but in which a crescendo-like rise in SGOT activity exceeded 100 units. Sampling (specimen, frequency, duration): *Blood *At weekly intervals or more often Lab Method: Serum bilirubin, thymol turbidity, SGOT and bilirubin in the urine

Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: Defined as the number of days between exposure and first evidence of abnormal serum transaminase activity as indicated by a SGOT level above 100 units. Data extracted for symptomatic children (i.e. those with (possible) anicteric hepatitis or hepatitis with jaundice) from two trials (trials 1 & 3). Data pooled to obtain median Results: *Median: 37 days *Range: 30-125 days (Number extracted from figures by Pallas)	Figure 1. First trial, occurrence of first attack of hepatitis after subjects were fed Willowbrook serum pool No. 5 (WSP-5). Second trial, occurrence of second attacks of hepatitis in same subjects following inoculation of WSP-5 six months later. First number indicates first day SGOT exceeded 100 units/ml; second number, first day SGOT declined to levels below 100 units; numbers in parentheses, peak SGOT levels.  	Figure 2. Third trial, occurrence of hepatitis in subjects who received serum (MS-1) obtained from patient Mir during first trial. Note onset of hepatitis after relatively short incubation period: relatively short period of abnormal transaminase activity; and high attack rate in control group. Fourth trial, occurrence of hepatitis in subjects who received serum (MS-2) from patient Mir during second trial. Note longer incubation period, longer period of abnormal transaminase activity, and contact infection in two of five control subjects  	Comments: *The children have low capability to maintain hygiene; this influences transmission *The children were admitted directly to a special isolation facility capable of housing up to 16 children. *The 10 cases in the first trial were induced by oral administration of Willowbrook serum pool; the 7 cases in the third trial were induced by giving MS-1 serum intramuscularly Limitations: *Definition of incubation period based on a laboratory-value, not a clinical symptom (although all cases presented here are symptomatic). The authors remark that definitions vary between studies; and most often incubation period has been measured as the number of days between exposure and either onset of symptoms or onset of jaundice; however jaundice may occur 2 days before or 2 weeks after illness onset and at Willowbrook most cases were anicteric and asymptomatic *Incubation period includes children who are asymptomatic

NR: not reported; SGOT: serum glutamic oxalacetic transaminase; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Reid Journal: Public Health Pub Year: 1986 Aim: To investigate outbreaks of hepatitis A in two primary schools in different parts of a city.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: Outbreak in school 1 started December 1983; outbreak in school 2 started in October 1983	Setting: Schools Source population: Children attending one of 2 mixed junior and infants school in Liverpool Sample: School 1: *n=121 children (93 in main school, 28 in nursery); cases identified by questionnaire (response rate ~95%); n=28 cases *In the main school: 46 boys (19 cases) and 47 girls (9 cases) School 2: *n=371; cases identified by questionnaires (response rate 166/76 (94%), 129/135 (96%) and 52/60 (86%) in junior department, infants pupil department and among voluntary pupils, respectively); n=16 cases 16 *92 boys (9 cases), 84 girls (4 cases)	Disease/infectious agent: Hepatitis A virus Case definition: *Child with a definite history of jaundice. This information was obtained by asking the parents on the questionnaire "Has your child ever had (yellow) jaundice or hepatitis?" Confirmation of affirmative answers was sought from notifications, sickness absence notes, teachers and, in a few cases, examination of blood samples. Lab method: Serum samples tested for IgM antibody to hepatitis A; technique NR

Outcome definition, results	Comments, limitations
Exclusion period: Until clinical recovery. The following control measures were instigated in both schools: 1. Daily visits to advise teachers about exclusion from school of children ""whose health caused them concern""; to keep a daily diary of absent children with reasons for absence; to check children returning to school after absence to ensure they had clinically recovered. 2. Standard regime for disinfecting toilets 3x/day with hypochlorite solution 3. Teachers repeatedly encouraged children to wash their hands (after toilet use, before meals) 4. In school 1, normal human immunoglobulin given on 28th November 1983 to all regular attenders at nursery class (no cases had occurred there, it was felt spread would probably be rapid among such young children if a case did occur) and offered to staff Results: These measures were apparently successful because no further cases occurred in either school after the lapse of one incubation period from the date the measures were instituted.	Comments: NR Limitations: *Multiple control measures instituted at once, therefore impossible to distil the role of exclusion

IgM: immunoglobulin M; NR: not reported.

Bacterial infections

Campylobacteriosis (n=8)

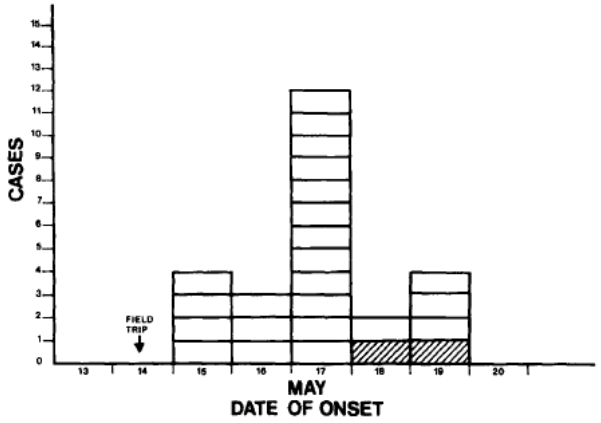
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Evans Journal: Epidemiol Infect Pub Year: 1996 Aim: To describe an outbreak of *Campylobacter* which occurred among nursery school children following an educational visit to a dairy farm.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: Exposure on 28 March 1994; questionnaire sent in April	Setting: Working dairy farm Source population: Nursery school class (including children, staff and parent helpers) that visit a nearby working dairy farm, in/around Cardiff Inclusion criteria: *Gastrointestinal infection *Visited farm Sample: *n=23 cases (20 children and 3 adults) *Age of children: 3-4 yrs; adults *Gender: NR	Disease/infectious agent: *Campylobacter jejuni* Source: Raw cow milk at dairy farm Case definition: *Diarrhea or abdominal pain within 10 days of the farm visit; and/or *Culture-confirmed *Campylobacter* infection. Sampling (specimen, frequency, duration): *Stools *NA Lab Method: Culture

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Days from exposure (March 28) to onset of illness Results: *Range: 2-7 days *Median: 4 days *Table. Cases drinking larger amounts of milk had shorter incubation periods and severer symptoms (not statistically significant)	Comments: *Fecal specimens were sought from all party members with recent illness and examined (15 cases were confirmed). Limitations: NR

Amount drunk	Mean (median) incubation period in days
Part	4.7 (4)
Whole	3.6 (4)
Extra	3.2 (3)

NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Korlath Journal: J of Inf Dis Pub Year: 1985 Aim: To report an outbreak of campylobacteriosis in which they were able to determine the vehicle of transmission, the incubation period ± 1 hr (SD), the length of time each patient excreted *C. jejuni*, the risk of transmission of secondary infection and to comment on the relation between the amount of raw milk consumed and the duration of severity of illness.	Country: United States Study design: Outbreak investigation Study period & duration: Exposure on May 14, 1981. Shedding measured till 6 weeks after date of onset of symptoms	Setting: Field trip to dairy farm Source population: Students from a single third-grade class of a suburban elementary school Inclusion criteria: *Participated in the field trip to a dairy farm Sample: *n=70 participated in a field trip, of whom n=25 developed acute enteritis. *C. jejuni* isolated from specimens of 13 children and 1 asymptomatic adult *Age of all members who developed *C. jejuni*: n=22 students and n=3 adult chaperones *M/F-ratio: 13/12	Disease/infectious agent: *Campylobacter jejuni* Source: Raw milk Case definition: *Diarrhea of <48-hr duration; and *Stool specimen postive for *C. jejuni;* or *Diarrhea of ≥48-hr duration accompanied by two or more of the following symptoms: cramps, fever, headache, mausea, or vomiting (with or without a stool specimen positive for *C. jejuni*) Sampling (specimen, frequency, duration): *Rectal swabs or stool specimens *Every two weeks until they produced specimens negative for *C. jejuni* Lab Method: Culture

Outcome definition, results		Comments, limitations
Outcome definition: Incubation period: From time of exposure till date of onset of symptoms Duration of shedding: Length of time that *C. jejuni* was excreted from onset of symptoms Results: Incubation period: *Range: 24-128 hr *Mean: 68 hr *Median: 66 hr Duration of shedding from onset of symptoms: *n=13 ceased shedding the bacteria within 4 weeks *n=1 shed organism until the sixth week	Figure. Cases of campylobacteriosis associated with consumption of raw milk by date of onset of illness. Unshaded rectangles, student; shaded rectangles, adult chaperone.  	Comments: NR Limitations: *A small proportion of adults were included in data of incubation period (n=3) *Period of shedding includes one asymptomatic adult

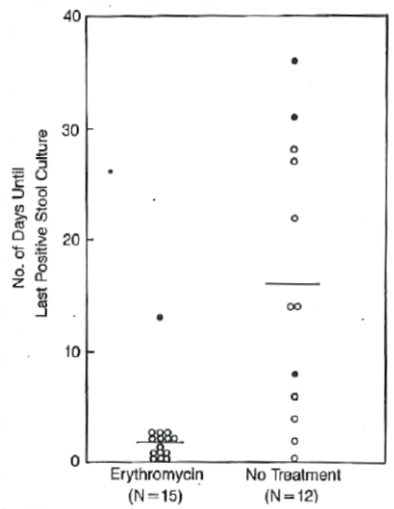
hr: hours; NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Mizuno Journal: J Infect Dis Pub Year: 1985 Aim: NR	Country: Japan Study design: Case series Study period & duration: NR	Setting: Hospital Source population: Children at the department of pediatrics, Kinki University School of Medicine, Nishiyama, Japan Inclusion criteria: *Patients with *C. jejuni* infection Sample: *n=36 *Age range: 1-13 yrs *Gender: NR	Disease/infectious agent: *Campylobacter jejuni* Case definition: *Patients (symptoms not further specified); and **C. jejuni* infection Sampling (specimen, frequency, duration): *Stools *Every day or every two days *NR for how long Lab method: Bacterial isolation

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Period of excretion by antibody-status (using purified antigen in ELISA assay), NR when measurement started in relation to onset of symptoms or ended Results: Mean bacterium-excreting days *Antibody positive: 5.9 (± 1.6) *Antibody negative: 13.8 (± 4.6)	Comments: NR Limitations: *NR when measured of shedding started *Very limited information on study population; unclear if the patients were consecutive or selected in any way

ELISA: enzyme-linked immunosorbent assay ; NR: not reported; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Pai Journal: Am J Dis Child Pub Year: 1983 Aim: To compare erythromycin ethylsuccinate therapy with no treatment of *Campylobacter enteritis* in infants and children.	Country: United States and Canada Study design: RCT Study period & duration: January 1980 to June 1981	Setting: Hospital Source population: Children who had stool samples submitted for bacteriologic examination at Montreal Children's Hospital and Oklahoma Children's Memorial Hospital, Oklahoma city Inclusion criteria: **Campylobacter* presumptively isolated from the stool *Patients still symptomatic by the time the laboratory results were known and the parents were contacted Exclusion criteria: *Presence of other enteric pathogens in the stool *Antibiotic therapy in the previous 2 weeks Sample: *n=32 patients enrolled, n=27 with complete data available, of whom n=12 had been randomized to the non-treatment group (and n15 to the erythromycin-treated group) *Age range in the non-treatment group: 0.58-12 yrs; mean (± SD): 3.7 (± 3.5) yrs *M/F-ratio in the non-treatment group: 8/4	Disease/infectious agent: *Campylobacter jejuni* Case definition: *Enteritis; and **Campylobacter* isolated from stool Sampling (specimen, frequency, duration): *Stool *Collected daily for 7 days and weekly thereafter Lab Method: Stool samples were cultured. Colonies were screened for *Campylobacter* by the oxidase test and final identification was confirmed by ability to grow at 37°C and 42°C, but not at 25°C, and sensitivity to nalidixic acid.

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Number of days until first negative stool culture after enrolment (in figure: number of days from enrolment to last positive stool culture) Results: *Range: 1-38 days from study start *Mean (± SD): 16.8 (± 12.5) days study start	*Figure: Effect of erythromycin ethylsuccinate therapy on duration of excretion of *Campylobacter* in stool. Number of days from start of therapy to last positive stool culture, including relapses for each patient, is shown. Data for non-treatment group are presented as if treatment was started on day of entry into study. Closed circles indicate patients with relapse; open circles, patients without relapse; and solid horizontal line, mean.  	Comments: *Number of days with diarrhea before entry into the study: Non-treatment group: range 1-15 days; mean (± SD): 3.8 (± 4.0) Treatment group: range 1-6 days; mean (± SD) 3.2 (± 1.7) *At time of enrolment there were no significant differences in age, sex, severity or duration of illness. *The treatment arm (n=15) received 40 mg/kg/day of erythromycin ethylsuccinate every 6 hrs for 7 days. Mean duration of shedding was significantly shorter in the treatment group: range: 1-3 days from start of treatment; mean (± SD): 2.0 ± 1.3 days from start of treatment ($p<0.001$) Limitations: *The study only included symptomatic cases, but most patients were no longer symptomatic when they were contacted after a presumptive bacteriologic diagnosis was made *Duration of shedding not from onset of symptoms, but from start of study

M/F-ratio: male-to-female ratio; SD: standard deviation; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Salazar-Lindo Journal: J Pediatr Pub Year: 1986 Aim: To evaluate the efficacy of early treatment with erythromycin on the duration of fecal excretion and of diarrhea associated with *C. jejuni*.	Country: United States Study design: RCT Study period & duration: January 1983 to March 1984	Setting: Hospital Source population: Children brought as outpatients to Cayetano Heredia University Hospital Inclusion criteria: *Acute diarrhea *Infection with *C. jejuni* *3 to 6 months of age *5 or more stools per day with gross blood or mucus for no longer than 5 days *No antibiotic treatment in previous 7 days *No other illness necessitating antibiotic therapy *Patients with mucus and no gross blood in the stools were included only if they had sheets of polymorphonuclear leucocytes by direct microscopic examination with methylene blue stain *Written informed consent Exclusion criteria: *Clinical signs of dehydration *Weight/length ratio <3rd percentile (according to standards published by United States National Center for Health Statistics, 1976) *Separate episode of diarrhea during the 2 weeks prior to coming to the hospital *Simultaneous infection with *Shigella* Sample: *n=28 included in the study, of which n=12 randomized to placebo (2 lost to follow-up on day 4 and excluded from analysis on duration of excretion) *Mean age in placebo group: 6.3 months (± 0.7); range 3-10 months *M/F-ratio in placebo group: 8/4	Disease/infectious agent: *Campylobacter jejuni* Case definition: *5 or more stools per day with gross blood or mucus for no longer than 5 days (patients with mucus and no gross blood in the stools were included only if they had sheets of polymorphonuclear leucocytes by direct microscopic examination with methylene blue stain); and *Positive for *C. jejuni* Sampling (specimen, frequency, duration): *Stools *Daily during treatment (except on Sundays and holidays) *Duration of treatment: 5 days Lab method: Culture

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Days to last positive stool culture (defined as day after which 3 consecutive cultures were negative), by day from the start of treatment Results: Range: 0-5 days from start of treatment; mean (± SE): 2.2 days from start of treatment (± 0.6)	Comments: *n=16 randomized to the erythromycin-group (2 lost to follow-up on day 3, and excluded from analysis on duration of excretion). Mean (±SE) age: 5.6 months (± 0.5) (range 3-9), 5 male. Duration of fecal excretion *of C. jejuni* significantly shorter in erythromycin group than in placebo group (p<0.01; range 0-5 days from start of treatment; mean (± SE): 0.5 days (± 0.3)) Limitations: *Measurement of duration of shedding by day of treatment, not day of disease onset *NR how much time there was between start of symptoms and start of treatment *Stopped measuring after 5 days, when 3 patients were still excreting C. jejuni

M/F: male-to-female ratio; RCT: randomized controlled trial; SE: standard error.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Taylor Journal: J Clin Microbiol Pub Year: 1988 Aim: To study the natural history of *Campylobacter* infections in Thailand to determine how host factors and strain differences can explain the clinical expression of infection.	Country: Thailand Study design: Case series Study period & duration: June to September 1985	Setting: Hospital Source population: Children who came to the Outpatient department of Children's Hospital, Bangkok Inclusion criteria: *Age <5 yrs *Diarrhea <24 hrs *First 10 children coming to the clinic each day for 5 days per week *Isolation of *Campylobacter* species from initial culture Exclusion criteria: *Erythromycin or tetracycline before culture Sample: *n=586 children with diarrhea; n=105 with confirmed *Campylobacter* infection *Age categories among children with *Campylobacter* infection: <6 months: n=23 6-11 months: n=39 12-23 months: n=34 24-35 months: n= 4 36+ months: n= 4 *Gender: NR	Disease/infectious agent: *C. coli* (12.5%), *C. jejuni* (87.5%) Case definition: *Diarrhea (≥3 loose stools or one loose stool combined with fever, vomiting, or abdominal pain) *Isolation of *Campylobacter* Sampling (specimen, frequency, duration): *Stools *Weekly *Until 3 negative consecutive stool cultures Lab method: MacConkey

<table>
<tr><th>Outcome definition, results</th><th></th><th>Comments, limitations</th></tr>
<tr>
<td>Outcome definition:
Duration of shedding: From first visit to the clinic until three consecutive negative stool cultures; for the serotype that was originally isolated

Results:
Children aged <1 yr
*Mean (± SEM) excretion time: 14 days (± 2). Shedding >1 month: 10/62 (16%)
Children aged 1-5 yr
*Mean (± SEM) excretion time: 8 days (± 2). Shedding >1 month: 1/42 (1%)</td>
<td>*Table. Proportion of isolation positive sample by week from first visit to the clinic
<table>
<tr><th>Week from first visit to the clinic</th><th>% positive (nr. of children examined)</th></tr>
<tr><td>Week 0:</td><td>100% (105)</td></tr>
<tr><td>Week 1:</td><td>54% (78)</td></tr>
<tr><td>Week 2:</td><td>37% (93)</td></tr>
<tr><td>Week 3:</td><td>23% (96)</td></tr>
<tr><td>Week 4:</td><td>16% (86)</td></tr>
<tr><td>Week 5:</td><td>10% (59)</td></tr>
<tr><td>Week 6:</td><td>14% (43)</td></tr>
<tr><td>Week 7:</td><td>5% (36)</td></tr>
<tr><td>Week 8:</td><td>8% (23)</td></tr>
<tr><td>Week 9:</td><td>0% (17)</td></tr>
<tr><td>Week 10:</td><td>0% (10)</td></tr>
</table>
</td>
<td>Comments:
*The duration of excretion was determined for the serotypes that were originally isolated at the start of the study, not for other Campylobacter serotypes isolated during later weeks, if any
*Campylobacter was isolated as the only pathogen from 50 (48%) of the 105 children

Limitations:
*Duration of shedding not measured from time of onset of symptoms, but from first visit to the clinic
*Duration of diarrhea before first visit to the clinic unknown</td>
</tr>
<tr><td colspan="3">Hrs; hours; nr.: number; NR: not reported; SEM: standard error of the mean; yrs: years;</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Uhnoo Journal: J Infect Pub Year: 1986 Aim: To examine the relative contributions of viral, bacterial and parasitic agents to enteric illnesses and to describe the patterns of infection among inpatients and outpatients by age, sex and season.	Country: Sweden Study design: Case series Study period & duration: January-December 1981	Setting: Hospital Source population: Children <15 years of age who directly sought medical advice at the Department of Pediatrics of the University Hospital of Uppsala during the study period, or for whom there was telephone consultation. Inclusion criteria: *Acute gastroenteritis *Stool samples available Sample: *416 children with gastroenteritis; of whom n=20 with *Campylobacter jejuni* infection; shedding data available for n=15 of them *Age range among all children with gastroenteritis: 0-15 yrs; 0-12 months, n=77; 13-24 months, n=63; 25-36 months, n=22; >36 months, n=38 *M/F-ratio among all children with gastroenteritis: 112/88	Disease/infectious agent: *Campylobacter jejuni* Case definition: *Acute gastroenteritis (diarrhoea (≥3 loose or watery stools for ≥1 day and for ≤14 days before arrival) with or without vomiting and fever); and *Laboratory-confirmed rotavirus infection Sampling (specimen, frequency, duration): *Stool *Collected from all patients as soon as possible after admission to hospital or after telephone consultation *From some patients, specimens were collected weekly or every fortnight to investigate duration of pathogen excretion Lab Method: Established methods

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: The number of days until the first negative culture or the last positive culture if >10 days had passed between the 2 specimens; most likely number of days after onset of symptoms (this is what was done for rotavirus, probably applies to the other pathogens too) Results: *Range 6-90 days after onset of diarrhea *Mean: 30 days after onset of diarrhea *Median: <21 days (half of the children with *C. jejuni* stopped shedding the bacteria within 3 weeks)	Comments: NR Limitations: *Sampling infrequent

M/F-ratio: male-to-female ratio; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Wood Journal: JAMA Pub Year: 1992 Aim: To determine the incidence of recognized outbreaks of *Campylobacter* enteritis associated with drinking raw milk during youth activities.	Country: United States Study design: Surveillance study Study period & duration: 10 years: 1 January, 1981-31 December, 1990	Setting: Countrywide Source population: All state health departments about reports of outbreaks of *Campylobacter* enteritis from drinking raw milk and all outbreaks associated with drinking raw milk during youth activities (preschool through college) Inclusion criteria: *Outbreak-associated cases *Persons in preschool through college *Drank raw milk Sample: *n=458 outbreak-associated cases among 1013 persons who drank raw milk in 20 outbreaks in 11 states; information on incubation period available for 16 outbreaks *Age: Preschool through college *Gender: NR	Disease/infectious agent: *Campylobacter* Source: Raw milk Case definition: *Ill person with stool sample positive for Campylobacter; or *Symptomatic with a gastrointestinal illness and was epidemiologically linked to a laboratory-confirmed case Sampling (specimen, frequency, duration): *Stool *NA Lab Method: NR

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time from exposure to onset of symptoms (based on 16 outbreaks, for 5 outbreaks the median was reported) Results: *Range: 1-10 days *Median: 3 days	Comments: *The data indicate that children in kindergarten through 3rd grade are the primary population at risk for acquiring *Campylobacter* enteritis Limitations: *Combined outbreaks of 11 states with only combined information on outbreak characteristics

NA: not applicable; NR: not reported

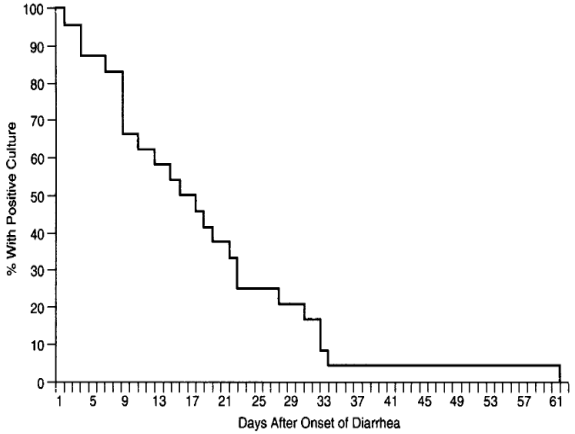
Escherichia coli infections (n=12)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Al-Jader Journal: Arch Dis Child Pub Year: 1999 Aim: To identify risk factors for transmission of verocytotoxin producing *Escherichia coli* O157 (VTEC)157 and means of prevention.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: August 10 to September 30, 1995	Setting: Nursery Source population: Children attending a nursery in North Wales Inclusion criteria: *Attended nursery during outbreak Sample: *n=104 children attended the nursery; n=31 cases; of whom n=19 were symptomatic *Age range of children at the nursery: 4 months-7 yrs; median age: 4 yrs *M/F-ratio among children at the nursery: 65/39	Disease/infectious agent: *E. Coli* O157 Phage type 2, excreting verocytotoxin type 2 and resistant to sulphonamides and tetracycline Case definition: *A child with verocytotoxin producing *E.coli* O157 (VTECO 157) isolated from faeces or history of HUS and antibodies to *E. coli* O157 lipopolysaccharide during the period 10 Aug-30 Sep, 1995 Sampling (specimen, frequency, duration): *Stool *NA Lab Method: Inoculation, culture and characterisation of isolates by phage typing, resistance typing, verocytotoxin typing and DNA based methods

Outcome definition, results	Comments, limitations
Exclusion period: All children excluded until they had produced 2 faecal cultures negative for VTEO157 by culture on SMAC and latex agglutination, effectively closing the nursery. On September 5, all children were excluded from the nursery until they had produced two faecal cultures negative for VTECO157 by culture on SMAC and latex agglutination, effectively closing the nursery. Results: The measure was successful in bringing the outbreak to an end	Comments: *19 had symptoms, 12 were asymptomatic. 1 was HUS. Limitations: NR

HUS: hemolytic-uremic syndrome; M/F-ratio: male-to-female ratio; NR: not reported; SMAC: sorbitol MacConkey agar; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Belongia Journal: JAMA Pub Year: 1993 Aim: To assess the occurrence of person-to-person transmission within day-care facilities by investigating facilities where an infected child attended after onset of symptoms.	Country: United States Study design: Outbreak investigation Study period & duration: July 1988 to December 1989	Setting: Child day-care facilities Source population: Children attending day-care facilities in Minnesota with reported *E. coli* O157:H7 outbreak Inclusion: *Reported cases of *E. coli* O157:H7 infection in children who attended day-care facilities after onset of illness Sample: *n=38 children in 9 child-care facilities met the case definition. Duration of shedding: serial stool samples obtained for 24 children 9 day care facilities. Exclusion: children attending 6/9 facilities *Duration of shedding: age: NR Exclusion: preschool children *Gender: NR	Disease/infectious agent: *E. coli* O157:H7 Case definition: *Individual who had *E. coli* O157:H7 isolated from a stool specimen; or *Child who developed either HUS or bloody diarrhea while attending a day-care facility with other culture-confirmed cases Sampling (specimen, frequency, duration): *Stools *Usually every 2-3 days *Until 2 negative stool samples were obtained Lab Method: Isolation; screened with 0157 antisera by tube agglutination

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Interval from diarrhea onset to the first (of 2) negative stool cultures Results: Range: 2-62 days from diarrhea onset Median: 17 days from diarrhea onset 3/14 (13%) children had evidence of shedding for <7 days; 9/24 (38%) for >20 day. Longest carriage (62 days) in a child who received amoxicillin 26 days after illness onset. Exclusion period: Excluded until 2 consecutive stool cultures (obtained ≥48 hours apart) were negative. Children attending 6 of the facilities were excluded from attending any day care outside their home until 2 consecutive stool cultures (obtained ≥48 hours apart) were negative because of the possibility of ongoing transmission while the investigation was in progress (including multiple cases of HUS or bloody diarrhea, or multiple children with stool cultures positive for *E. coli* O157:H7 in one facility). Results: There was no evidence of continued transmission after the exclusion policy was implemented.	*Figure. Duration of fecal shedding of *E. coli* O157:H7 for 24 infected, symptomatic children who provided serial stool cultures  	Comments: NR Limitations: *Duration of shedding may be overestimated because children with short-term shedding were more likely to be culture-negative when tested. *The longest carriage (62 days) occurred in a child who received amoxicillin 26 day after illness onset. Information on antibiotic use after onset not systematically obtained for other children, but likely negligible as antibiotics can be contra-indicated in the case of *E. coli* infection

HUS: hemolytic-uremic syndrome; NR: not reported

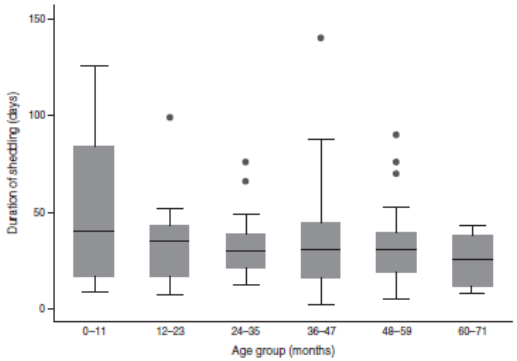
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Brandt Journal: J Pediatrics Pub Year: 1994 Aim: To describe the clinical course of the patients, compare the experience with previously reported outbreaks of HUS (hemolytic-uremic syndrome), and to discuss the public health implications of epidemic *E. coli O157:H7*-associated HUS.	Country: United States Study design: Case series Study period & duration: December 1, 1992 to February 28, 1993	Setting: Hospital and medical center Source population: Children seen at the children's hospital and medical center in Seattle Inclusion criteria: *Characteristic features of HUS (microangiopathic hemolytic anemia, thrombocytopenia, and azotemia) *Onset of a gastrointestinal prodrome within the 21 days before HUS developed *Ingestion of all or a part of a hamburger at an establishment known to have received *E. coli O157:H7*-tainted ground beef and implicated in the outbreak through evaluations by the Washington State Department of Health or; *Close contact with an individual with culture-confirmed *E. coli O157:H7* enterocolitis or; *Isolation of *E. coli O157:H7* in culture of a stool sample Exclusion criteria: *History of proteinuria before HUS Sample: *n=37 children who met the case definition were identified of whom n=26 had a known exposure date *Median age of all cases: 5 yrs (range: 1-15 yrs) *Gender of all cases: 43% male	Disease/infectious agent: *E. coli O157:H7* Source: Hamburger made of *E. coli O157:H7*-tainted ground beef Case definition: *Gastrointestinal symptoms (hemorrhagic colitis, rectal prolapse, vomiting and abdominal pain without diarrhea); and **E. coli O157H7* confirmed by culture of a stool sample Sampling (specimen, frequency, duration): *Stools Lab method: MacConkey-sorbitol agar and O157 particle agglutination test
Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: Days from exposure to onset of gastrointestinal symptoms Results: Days until onset of symptoms Range: <1 day to 21 days; median: 4.5 days			Comments: *32/37 children had *E. coli* confirmed by culture of a stool sample Limitations: *Sample comprised children who develop HUS after *E. coli O157:H7*. This group could differ from children who do not develop HUS
HUS: hemolytic-uremic syndrome; yrs: years.			

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Brown Journal: Pediatr Infect Dis J Pub Year: 2012 Aim: To investigate an outbreak of O26:H11 infection among children <48 months of age and employees at a child care center; to determine the cause and extent of the outbreak and to prevent and control further illness among children and employees at the center.	Country: United States Study design: Outbreak investigation Study period & duration: May 24 to August 27, 2010	Setting: Child care center Source population: Employees and children in childcare center (with 3 infant rooms (age 6 weeks-18 months), 2 toddler rooms (18-35 months) and a 3-year-old room (36-47 months)), in Colorado A questionnaire was sent to all employees and parents of every child <48 months. Both confirmed and suspected cases were included, but shedding duration was only presented for confirmed symptomatic cases for whom follow-up testing was available Sample: *n=55 children, of whom n=33 were cases; of whom n=17 were confirmed (and n=16 suspected); following up testing available for 12/13 confirmed symptomatic cases. *Age among confirmed cases <12 months, n=6; 12-23 months, n=4; 24-35 months, n=2; 36-47 months, n=5 *Gender: NR	Disease/infectious agent: *E. coli* O26:H11 Case definition: *Confirmed case: Laboratory confirmed O26:H11 *Suspected case: Any diarrheal illness beginning on or after May 24, 2010 Sampling (specimen, frequency, duration): *Stool *Frequencies and intervals of follow-up testing were based on convenience and were therefore variable for each patient Lab Method: Isolates were tested using standard STEC biochemical panel and shiga toxin PCR, and then forwarded to CDC for serotyping. Isolated were characterized by pulsed-field gel electrophoresis

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding in symptomatic confirmed cases: Interval between the onset of illness and the date of the first negative Shiga toxin PCR test Results: *Range: 14-52 days after onset of illness *Median: 30.5 days after onset of illness *Duration of shedding was ≥3 weeks for 10 (83%) children *Intermittent shedding (one or more positive tests after the first negative test was obtained in a patient) was detected in 3 (17%) confirmed cases. Among these, the maximum intervals between positive specimens were 8, 14, and 31 days.	Comments: *4 (22%) confirmed cases were asymptomatic, including one employee. As only one employee was confirmed, all other confirmed cases were children Limitations: *Calculation of the duration of shedding is likely to be an overestimate because children who shed for shorter periods were more likely to be negative when they were first tested

CDC: Center for Disease Control and Prevention; NR: not reported; PCR: polymerase chain reaction; STEC: shiga-toxin producing *E. coli*

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Dabke Journal: Epidemiol Infect Pub Year: 2013 Aim: To assess the duration of shedding and estimate the risk of transmission of VTEC from infectious young children in child care facilities in England and to help inform any revision of national guidance.	Country: United Kingdom Study design: Case series Study period & duration: 18 months (2010-2011)	Setting: Childcare facilities (schools and nurseries) Source population: National enhanced VTEC surveillance system Inclusion criteria: *Laboratory confirmed VTEC cases aged ≤5 years *Residing in England *Attending childcare facilities including schools and nurseries *Disease onset between January 1, 2010 and July 7, 2011 *Data was available on HPZone Sample: *n=349 confirmed VTEC cases aged ≤5 yrs in HPZone; of which n=234 attended childcare facilities; for whom n=225 information was available in HPZone and were included in the study. 204 cases were symptomatic. Duration of shedding calculated for 151/225; duration of exclusion for n=162/225. *Age range among children included in the study: 0-71 months; median 3 yrs (IQR 2-4) *M/F-ratio among children included in the study: 107/118	Disease/infectious agent: VTEC: *E. coli* O157 (98.7%), *E. coli* O26 (1.3%), missing (0.9%); PT21/28 (37%), PT8 (30%), PT2 (10%) Case definition: *An individual with VTEC isolation confirmed by PCR identification of verocytotoxin-encoding genes by the reference laboratory (Laboratory of Gastrointestinal Pathogens at HPA Colindale, London). *Primary, co-primary, secondary case definition according to HPA guidance Sampling (specimen, frequency, duration): *Stool *NR Lab Method: PCR identification of verocytotoxin-encoding genes by the reference laboratory (Laboratory of Gastrointestinal Pathogens at HPA Colindale, London)

Outcome definition, results			Comments, limitations
Outcome definition: Duration of shedding: Interval from date of onset of illness to the date of the first of two consecutive negative stool specimens. Results: *Median: 31 days after onset of illness (IQR 17-41 days) *48% (95%CI 40-56) shed ≤30 days; 44% (95%CI 36-52) shed for 31-60 days; 8% (95%CI 4-12) shed for >60 days *Younger children shed for longer (7% drop in duration of shedding per year, 95% CI 1-14, p=0.04); no significant difference by gender or phage type. Exclusion period defined as interval from date of onset to the date when the child was cleared to return to the childcare setting. Date of onset is proxy for date of actual exclusion. Exclusion period: The median duration of exclusion was 39.5 days (IQR 28-52, based on n=162) Results: The exclusion period was at least 2 weeks longer than the duration of shedding in 34/150 cases (23% (95%CI 16-30) where both duration of shedding and exclusion were known	*Table. Median duration and range of shedding of VTEC in days by age and gender in children attending childcare settings, England, 2010-2011 Median duration of shedding, days (interquartile range) Age group (months) / Male ($n = 71$) / Female ($n = 80$) / Total ($n = 151$) 0–11 / 45 (9–84) / 38 (17–85) / 40 (17–84) 12–23 / 37·5 (17–45) / 33 (18–38) / 35 (17·5–43) 24–35 / 32 (28–38) / 27·5 (18·5–37·5) / 30 (22–38) 36–47 / 24 (15–43) / 37 (18–45) / 31 (16–45) 48–59 / 31·5 (13·5–42) / 30·5 (23·5–38·5) / 30·5 (19·5–39·5) 60–71 / 22 (11–38) / 25 (18–37) / 25 (12–38) Total / 30 (16–41) / 31 (18–40·5) / 31 (17–41)	*Figure. Duration of shedding of VTEC in days by age group of child (n=151). Grey bars: IQR; horizontal line within bar: median; whiskers: 1.5 IQR beyond 25th and 75th percentiles; outliers: >1.5 IQR beyond 25th and 75th percentiles.  	Comments: *30% (n=61) of excluded cases had difficulty in implementing exclusion (mostly due to parental anxiety and communication issues) Limitations: *Asymptomatic cases (21/225) were included, however as duration of shedding is measured start on date of onset of illness, Pallas assumes there are no asymptomatic cases in the shedding data. Unknown which % of cases was asymptomatic among the cases in objective 3

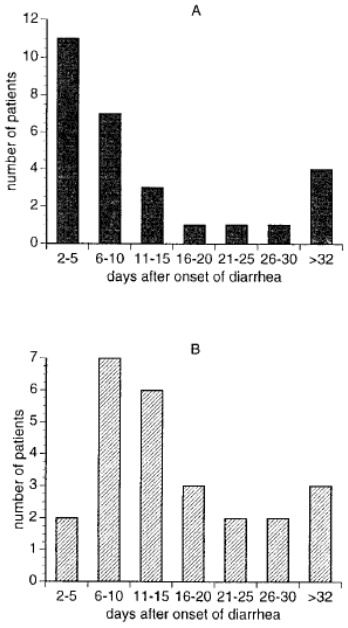
CI: confidence interval; HPA: Health Protection Agency; HPZone: Health Protection Information Management System; IQR: Interquartile range; M/F-ratio: male-to-female ratio; yrs: years; PCR: polymerase chain reaction; VTEC: Verocytotoxin-producing *Escherichia coli*; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Haltalin Journal: Amer J Dis Child Pub Year: 1972 Aim: To investigate the clinical and bacteriologic effectiveness of ampicillin in outpatients with *Shigellosis*. Secondary aims of the study were: (1) to document the bacterial causes of acute diarrhea in a socioeconomically disadvantaged population during peak periods of diarrhea; (2) to determine the efficacy of ampicillin in patients excreting enteropathogenic serotypes of *Escherichia coli* and *Salmonella* species; (3) to investigate the effect of ampicillin in patients from whom no pathogens were isolated; and (4) to contrast clinical findings among the various etiologic groups.	Country: United States Study design: Double-blind placebo-controlled treatment study Study period & duration: June 9 to November 5, 1969 and from April 7 to November 18, 1970	Setting: Children's Medical Center Source population: Infants and children seen at the outpatient department of Children's Medical Center in Dallas Inclusion criteria: *>3 months *Having acute diarrheal disease not requiring hospital admission *Infected with *Escherichia coli* Exclusion criteria: *Antibiotics given for the present illness or during the preceding two weeks *Any associated illnesses requiring antibiotic therapy *History of allergy to penicillin or its derivatives Sample: *Total study population infected with *E. coli* n=34, of whom n=18 assigned to the control group *Age: NR *Gender: NR	Disease/infectious agent: *E. coli 0111* (n=6), *E. coli 0119* (n=4), *E. coli 055* (n=3), *E. coli 0126* (n=2), *E. coli 0127, E. coli 0128* and *E. coli 086* (all n=1) Case definition: *Acute diarrhea; and **E. coli* pathogen isolated Sampling (specimen, frequency, duration): *Rectal swabs *Collected at two clinical visits (scheduled in 1 week) and at one return visit (scheduled one week after the last clinical visit) *Maximum duration of sampling of 5 days Lab method: Eosin-methylene-blue agar; identification of growth done by standard biochemical and slide agglutination techniques

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Calculated from admission to study Results: Negative culture >48 hours after start of the study: 8/11 (73%) Culture positive after 5 days: 6/10 (60%)	Comments: *The proportion of children shedding *E. coli* was not different between the treated (Ampicillin) and placebo group at the three time points *Infants under 3 months of age were not included in the study, but comprised about one half of all patients with *E. coli* Limitations: *Poor follow-up *Duration of illness before initial clinic visit unknown *Duration of shedding not measured from time of onset of symptoms

NR: not reported.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Karch Journal: J Clin Microbiol Pub Year: 1995 Aim: To investigate the length of time that Shiga-like toxin-producing *Escherichia coli* O157 is excreted after the onset of diarrhea/to determine the potential role of long-term carriage in infection spread among children not treated with antibiotics	Country: Germany Study design: Monitoring study Study period & duration: March 1988 to December 1993	Setting: Pediatric centers Source population: Children attending different pediatric centers in Germany Inclusion criteria: *Diarrhea or hemorrhagic colitis; or HUS *Had not received any antibiotic treatment Sample: *n=53 cases (diarrhea or hemorrhagic colitis: n=28, HUS n=25); n=456 serial stool samples obtained *Median age: 3.6 yrs; range 7 months to 9 yrs *Gender: NR	Disease/infectious agent: *E. coli* O157 Case definition: *Diarrhea or hemorrhagic colitis; or HUS; and *Confirmed *E. coli* O157 Sampling (specimen, frequency, duration): *Stool samples *2-4 day intervals Lab Method: DNA probes followed by agglutination with a specific antiserum.

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Interval from onset of diarrhea to the last positive sample followed by three negative stool cultures. Results: *Diarrhea or hemorrhagic colitis patients: Range: 2-62 days after onset of diarrhea Mean or median: 13 days after onset of diarrhea *HUS patients: Range: 5-124 days after onset of diarrhea Mean or median: 21 days after onset of diarrhea *Shedding significantly longer in patients with HUS than in those with only diarrhea or hemorrhagic colitis ($p<0.001$) *In 36 patients (68%) only the first culture was O157 positive and the 3 cultures that followed were negative *12 patients (incl. 7 with HUS) were intermittent shedders	*Figure. Recovery of *E. coli* O157 in stool samples from patients with diarrhea (A) and HUS (B). The duration of shedding was estimated as the interval from onset of diarrhea to the last O157-positive culture followed by 3 negative stool cultures collected at 2-4 day intervals. 	Comments: *For the patients with diarrhea or hemorrhagic colitis only, the first stool samples were collected 1-6 days after onset of diarrhea (median 3 days). For the patients with HUS, stools were collected during the acute phases of HUS (range 7-17 days after onset of diarrhea; median 9 days) *Comparison of the first and *last E. coli* O157 isolated by pulsed-field gel electrophoresis revealed that in 3/7 long-term shedders, pulsed-field gel electrophoresis types varied. In 2 cases, a Shiga-like toxin gene was apparently lost during infection. Limitations: *Unclear if the shedding duration is expressed as a mean or as a median, or whether the median and the mean as the same (in the abstract the authors wrote 'median', in the text they wrote 'mean')

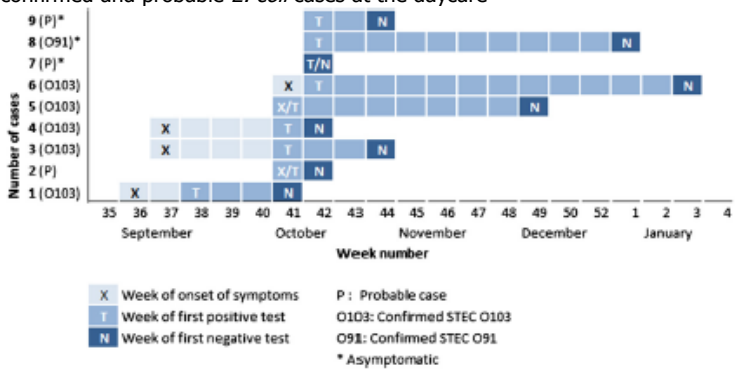
DNA: deoxyribonucleic acid; HUS: hemolytic uremic syndrome; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Keene Journal: N Engl J Med Pub Year: 1994 Aim: To identify the extent of the *E. coli* outbreak, the source of infection and the means of control.	Country: United States Study design: Outbreak investigation Study period & duration: July 1 to August 20, 1991	Setting: Lakeside park Source population: Patients identified through routine surveillance reports or through follow-up of these and other reports to local health departments, in Portland Inclusion criteria: *Residents of the four-county Portland area *Reported *E. coli* O157:H7 infection *Onset of illness from July 1 to August 20, 1991 Sample: *n=21 case patients with park-associated *E. coli* O157:H7 infections (18 confirmed by stool culture and 3 by serology) *Median age: 6 yrs; range 1-16 yrs *Gender: NR	Disease/infectious agent: *E. coli* O157:H7 Source: Lake water was the most likely vehicle for the transmission Case definition: *Park-associated case patients: subjects whose symptoms began 1-10 days after visiting the park; and *Positive stool culture for *E. coli* O157:H7 or serologic evidence of *E. coli* O157:H7 infection and either bloody diarrhea or hemolytic-uremic syndrome. Sampling (specimen, frequency, duration): *Stools *NA Lab Method: *Stool cultures: Isolates were identified by standard methods (manual of clinical microbiology, 1991). *Serum specimens: assayed for antibodies to *E. coli* O157:H7 lipopolysaccharide antigens

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time between visit of the park and onset of symptoms Results: *Range: 1-10 days *Median 4 days	Comments: *Persons whose symptoms began ≥2 days after another household member's illness were considered possible secondary case patients and were excluded from the analysis. *Source of infection was fecally contaminated lake water *All cases were symptomatic Limitations: *The maximum incubation period was part of case definition

NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: MacDonald Journal: BMC Info Dis Pub Year: 2014 Aim: To describe the results of the outbreak investigation and discuss the implications of screening and the exclusion policies for children attending daycare in Norway.	Country: Norway Study design: Outbreak investigation Study period & duration: Study period from September 1 to October 31, 2012. October 16, 2012 the National institute of Public Health was notified, school was closed on 17 October for extensive cleaning and reopened on 22 October	Setting: Daycare centre Source population: Children at the daycare center, southern Norway Inclusion criteria: *Tested positive for *STEC* between September 1 and October 31, 2012 *Submitted a stool sample prior to returning to the daycare centre *Attending the daycare centre during study period Sample: *n=91 children attended daycare centre during study period, of whom n=9 tested positive for *E. coli* (6 confirmed cases, 3 probable cases), and n=6 had symptoms (5 confirmed cases, 1 probable case) *Median age of all positive cases: 2 yrs (range: 1-4 yrs) *Gender of all positive cases: 88.9% male	Disease/infectious agent: *E. coli O103:H2*, *eae* and *stx1a*-positive (n=5), *eae* and *stx1*-positive (n=1) Case definition: *Symptoms (fever or diarrhea); and *Only preliminary *stx*-gene finding in a stool sample (probable case) or *STEC* infection confirmed by the National Reference Laboratory (confirmed case) Sampling (specimen, frequency, duration): *Stools *Samples collected at minimum interval of 24 hours until 5 consecutive specimens were obtained *Samples collected till October 31, 2012 Lab method: PCR-method

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Period between symptom onset and the date of the first negative control test Results: Days of shedding from start of onset of symptoms Range: 7 - 98 days Exclusion period: *Total duration of exclusion for n=9 cases (6 symptomatic, 3 asymptomatic cases): 459 days. Median exclusion period: 53 days per child *Duration of exclusion for confirmed cases (n=6, including one asymptomatic case): range 37 - 109 days; median: 71 days School was closed on October 17, and reopened on October 22, 2012 for children who had negative test results for *STEC.* Duration of exclusion from daycare was calculated as the period of symptom onset (or date of testing for asymptomatic cases) to the date of the last required control test. The required number of consecutive negative control tests before returning to daycare was 5 consecutive negative results (diagnosed with *stx2*-positive *STEC* or a *STEC* serogroup; uncomplicated diarrhea with only *stx1*-positive *STEC* but serotype previously associated with HUS; or *STEC* infection with severe clinical presentation, such as bloody diarrhoea or HUS) or 3 consecutive negative results (uncomplicated diarrhea with only stx1-positive *STEC*). Results: The outbreak was interrupted	*Figure. Dates of symptom onset, first positive test and first negative test of confirmed and probable *E. coli* cases at the daycare  	Comments: *For children wearing diapers and the frequency of diarrhea, parents were asked to specify whether their child had looser stools than normal, more frequent stools than normal and/or diarrhea Limitations: *As a sensitive definition for possible cases of *STEC* infection was used, it is conceivable that cases of gastroenteritis of differing etiology, such as norovirus, occurred during the same period

HUS: hemolytic-uremic syndrome; PCR: polymerase chain reaction; STEC: Shiga toxin-producing Escherichia coli; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Shah Journal: Clin Infect Dis Pub Year: 1996 Aim: To report the duration of excretion of *E. coli* O157:H7 among children in an outbreak at a day care center.	Country: United States Study design: Outbreak investigation Study period & duration: June 1995	Setting: Day care center Source population: Children in a child care center, in Colorado Inclusion criteria: *Any child within the child care center who had a stool culture positive for *E. coli* O157:H7 or who had diarrhea for ≥2 days Sample: *n=24 cases with hemorrhagic colitis; n=12 were positive for *E. coli* O157:H7; of whom n=9 were not treated with antibiotics *Age: children *Gender NR	Disease/infectious agent: *E. coli* O157:H7 Case definition: *Stool culture positive for *E. coli* O157:H7; and/or *Child within the child care center who had diarrhea for ≥2 days Sampling (specimen, frequency, duration): *Stool *Stools collected until 2 consecutive stools cultures were negative Lab Method: Culture

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: The interval from the onset of diarrhea to the first of 2 consecutive negative stool cultures Results: *Among culture-positive children that did not receive antibiotics (n=9): Mean (± SD): 30.1 (± 13.0) days after onset of diarrhea *Among all culture-positive children (n=12): The duration of shedding was ≥3 weeks for 92% of the children	Comments: *3 culture positive children who were treated with antibiotics had a mean (± SD) duration of excretion of 35.7 days (± 12.4) *For the n=12 positive children including those receiving antibiotics, the shedding range was 11-57 days (median 29) *The average time between the onset of symptoms and the first positive stool culture was 10.5 days for the 12 culture-positive children, whereas the average time between the onset of symptoms and the first negative stool culture was 22.5 days for the 12 culture-negative children *By arbitrarily assuming a conservative shedding period of 7 days for the 12 culture-negative cases; the mean duration of shedding was recalculated for all 24 cases (including 3 the received antibiotics) to be 19.3 days Limitations: *12 culture-negatives who met the case definition were not included in the calculation of shedding. Since they probably shed for shorter periods, the study may overestimate the duration of shedding

NR: not reported; SD: standard deviation

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Uhnoo Journal: J Infect Pub Year: 1986 Aim: To examine the relative contributions of viral, bacterial and parasitic agents to enteric illnesses and to describe the patterns of infection among inpatients and outpatients by age, sex and season.	Country: Sweden Study design: Case series Study period & duration: January to December 1981	Setting: Hospital Source population: Children <15 years of age who directly sought medical advice at the Department of Pediatrics of the University Hospital of Uppsala during the study period, or for whom there was telephone consultation. Inclusion criteria: *Acute gastroenteritis *Stool samples available Sample: *416 children with gastroenteritis; of whom n=17 with enteropathogenic *Escherichia coli* infection; shedding data available for n=6 of them *Age range among all children with gastroenteritis: 0-15 yrs; 0-12 months, n=77; 13-24 months, n=63; 25-36 months, n=22; >36 months, n=38 *M/F-ratio among all children with gastroenteritis: 112/88	Disease/infectious agent: Enteropathogenic *E. coli* Case definition: *Acute gastroenteritis (diarrhoea (≥3 loose or watery stools for ≥1 day and for ≤14 days before arrival) with or without vomiting and fever); and *Laboratory-confirmed rotavirus infection Sampling (specimen, frequency, duration): *Stool *Collected from all patients as soon as possible after admission to hospital or after telephone consultation. *From some patients, specimens were collected weekly or every fortnight to investigate duration of pathogen excretion Lab Method: Cell culture and agglutination methods

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: The number of days until the first negative culture or the last positive culture if >10 days had passed between the 2 specimens; most likely number of days after onset of symptoms (this is what was done for rotavirus, probably applies to the other pathogens too) Results: *Range: 20-36 days after onset of diarrhea *Mean: 29 days after onset of diarrhea	Comments: NR Limitations: *Sampling infrequent

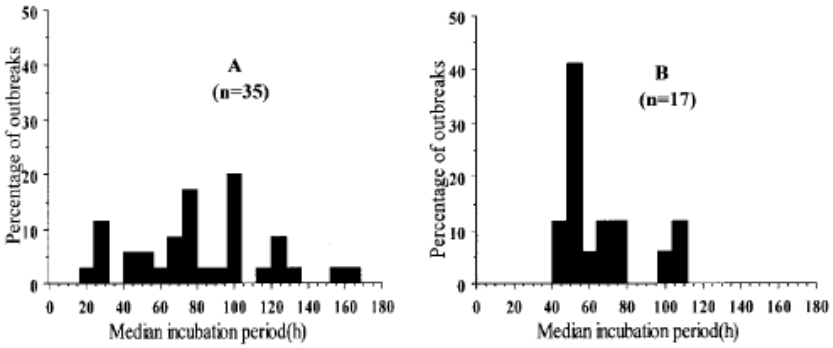
M/F-ratio: male-to-female ratio; NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Vonberg Journal: Clinical Infectious Diseases Pub Year: 2013 Aim: To examine the duration of fecal shedding of *E. coli* O104:H4 in patients involved in the German 2011 outbreak.	Country: Germany Study design: Outbreak follow-up, prospective multicentre study Study period & duration: May-July 2011 Outbreak began beginning of May, peaked May 22nd, ended July 26th; This study started May 11th and 14th of December the last microbiologic testing was performed	Setting: Hospital Source population: Patients treated at 1 of 5 tertiary care hospitals in Northern Germany (Hannover, Hamburg, Kiel, Lübeck and Münster) Inclusion criteria: *Microbiology-confirmed *E. coli* O104:H4 infection during an outbreak Sample: *n=321 microbiology-confirmed *E. coli* O104:H4 (at least 111 patients 34.6% had received antibiotic treatment during the acute phase of the illness); n=252 for the multivariable model *Median age among all microbiology-confirmed cases: 40 yrs; range 1-89 yrs; mean 41.9 yrs *M/F-ratio among all microbiology-confirmed cases: 104/217	Disease/infectious agent: Shiga toxin-2 producing *E. coli* serotype O104:H4 Case definition: *Microbiologically confirmed cases Sampling (specimen, frequency, duration): *Stool *Stool tests on a weekly basis *A postdischarge surveillance was performed on patients who still tested positive for the pathogen at the end of their hospital stay Lab Method: *Culture on selective media *Toxin ELISA *Polymerase chain reaction

Outcome definition, results		Comments, limitations
Outcome definition: Shedding: The first negative test result that was not followed by new positive test results; measured from onset Results: *Multivariable analysis of shedding duration: A Weibull model containing main effects of study center (5 levels), HUS (binary), sex (binary), antibiotic treatment (binary) and binary age group (≤15, >15 years) was fitted. In the fitted model, all main effects, except sex, were significant. The table shows the resulting quotients of the median shedding duration from time of disease onset compared to the reference category. The reference category is "adult female in Hamburg with HUS but without antibiotic treatment". As an example, the median shedding duration of patients with HUS and without antibiotic treatment would have a median shedding duration of 17.2x1.9=32.2 days. *Estimated quotient of the median shedding duration for those Aged ≤15 yrs with HUS without antibiotic treatment (female, Hamburg): 1.6 (95% CI: 1.0-2.4), i.e. 17.2*1.6=27.5 (95%CI 17.2-41.3) days; Aged ≤15 yrs without HUS without antibiotic treatment (female, Hamburg): 1.9 (95%CI 1.4-2.5), i.e. 27.5*1.9=52.3 (95%CI 38.5-68.8)	*Table. Results from the Weibull model contains main effects of study center, HUS, sex, antibiotics, and age fitted on 252 patients. Variable / Level / Estimated Quotient / 95% CI Study center / Hannover / 1.1 / .5–2.1 Münster / 1.4 / .8–2.3 Lübeck / 1.4 / 1.1–1.8 Kiel / 0.5 / .3–.7 HUS / No / 1.9 / 1.4–2.5 Sex / Male / 1.1 / .9–1.4 Antibiotic treatment / Yes / 0.7 / .5–.9 Age / ≤15 y / 1.6 / 1.0–2.4 The table shows the estimated quotient of the median shedding duration compared to the reference category and corresponding 95% confidence intervals. See text for details. Abbreviations: CI, confidence interval; HUS, hemolytic uremic syndrome.	Comments: *The outbreak strain differs essentially from typical STEC strains because it displays a hybrid virulence profile that combines typical molecular and phenotypic characteristics of STEC and EAEC and phylogenetically belongs to EAEC rather than to STEC *The date of disease onset was known for 234 patients (72,9%) whereas for 87 patients (27.1%) no exact date for the onset of disease was available, to still include these patients, a median delay between onset of symptoms and hospitalisation was calculated (4 days) *77/321 was the last available pooled test results still positive, as a consequence, patients were right censored *Figure is available shedding duration by age group, however this includes patients who received antibiotics *Figure is available shedding duration by antibiotic yes/no, however this includes adults Limitations: *HUS patients are strongly overrepresented among cases in this study because more cases were selectively referred to the participating tertiary care hospitals *Because culture media selective for ESBL-carrying bacteria were used for the follow up cultures, there is a potential risk to underestimate shedding time if the strain lost the ESBL plasmid *A significant part of the hospitalized patients received antibiotic therapy this fact may lead to a slight overestimation of the shedding time in antibiotic treated patients *Patients age had influence on the duration of *E. coli* shedding *The type and the overall number of tests applied for the diagnosis of STEC infection differed between participating centres *The sensitivity and specificity of the particular tests used by the participating centres varies
EAEC: enteroaggregative *E. coli*; ELISA: enzyme-linked immunosorbent assay; ESBL: extended-spectrum β-lactamase; HUS: haemolytic uremic syndrome; STEC: Shiga toxin–producing *Escherichia coli*		

Non-typhoid *Salmonella* infections (n=12)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Abe Journal: J Food Prot Pub Year: 2004 Aim: To study the factors underlying the long incubation periods of several gastroenteritis outbreaks caused by *Salmonella*-contaminated lunches at elementary, junior high and nursery schools frequently observed between 1990 and 1999.	Country: Japan Study design: Multiple survey analysis Study period & duration: 1982 - 2002	Setting: Elementary and junior high schools; nursery schools; restaurants, take-out food shops and hotels; and hospital and welfare facilities Source population: "Food Poisoning Investigation Reports" collected from 39 prefectures and 9 government-designated major cities in Japan from 1982-2002 describing outbreaks caused by *Salmonella enteritidis* (SE) and had data for incubation periods and microbiological tests Inclusion criteria: *The number of patients in the outbreak was ≥10 *Fecal cultures were positive for *Salmonella enteritidis* negative for other pathogens *Causative meals or dishes were identified on the basis of microbiological tests or through interviews with the patients regarding foods eaten before the onset of disease Sample: *185 outbreaks with n=27,463 patients; 35 outbreaks were in elementary and junior high schools and 17 in nursery schools *Average age: 10.6 yrs in schools and 4.5 yrs in nursery schools. *M/F-ratio for all patients: 54.2%/45.8%	Disease/infectious agent: *Salmonella enteritidis* Source: School and nursery school lunches Case definition: *NR Sampling (specimen, frequency, duration): *NR Lab Method: NR (only for the foods)

Outcome definition, results		Comments, limitations
Outcome definition: In the investigation reports (surveys), each patient is tabulated in terms of incubation period (every 6 to 24 h). Authors selected the middle time of each incubation period range as the representative value, and the median incubation period was calculated from the representative value of the range. Results: *Elementary and junior high schools: median (± SD): 80.9 (± 35.876) hours *Nursery schools: median (± SD): 64.8 (± 21.583) hours	*Figure. Distribution of median incubation period of *Salmonella Enteritidis* outbreaks classified according to kind of causative cooking facilities: (A) elementary and junior high school lunches, 35 outbreaks; (B) nursery school lunches, 17 outbreaks  	Comments: *The distribution of incubation periods was broader for school and nursery school lunches than for the other groups (i.e. restaurant, take out food-shops, hotels, and hospital and welfare facilities). The median incubation period was significantly longer for school and nursery school lunches than for food prepared in other cooking facilities ($p < 0.01$), presumably because of the significantly shorter time elapsed from the start of the cooking process to the consumption of school and nursery school lunches, suggesting limited bacterial growth. NB, for the comparisons: Outbreaks other those in schools and nurseries likely include many adults *A significant negative correlation between the bacterial dose ingested per person and the median incubation period was shown (over all cooking facilities, $p<001$) *A negative correlation was observed between the attack rate and the median incubation period (analysis of 50 food poisoning cases caused by school and nursery school lunches) Limitations: *NR how many cases were involved in the school and nursery outbreaks *It is possible that the outbreaks at schools and nurseries still include a few adults (e.g. teachers, kitchen staff)

M/F-ratio: male-to-female ratio; NR: not reported; SD: standard deviation; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Barbara Journal: Aliment Pharmacol Ther Pub Year: 2000 Aim: To investigate the role of antibiotic therapy on faecal germ excretion and long-term digestive symptoms after *Salmonella* infection.	Country: Italy Study design: Outbreak investigation Study period & duration: Outbreak following exposure on October 19, 1994 + 3 months follow-up	Setting: Schools Source population: Pupils and teachers of 36 schools in Bologna, Italy, to which contaminated food was delivered Inclusion criteria: *Met case definition *Completed symptomatic questionnaire *Underwent repeated stool cultures Sample: *Outbreak with n=1554 patients, of whom n=1227 did not receive antibiotics. Extra stool cultures obtained for n=649 patients, of whom n=508 did not receive antibiotics. *Age among the n=1227 patients who did not receive antibiotics, 3-5 yrs: n=397; 6-10 yrs: n=775; adults: n=55. Age of 649 patients in with extra stool cultures: 3-5 yrs: n=199, 4-6 yrs: n=408, adults: n=42. *Gender: NR	Disease/infectious agent: *Salmonella* Enteritidis Source: Food-borne intoxication (food not specified) Case definition: *Affected subjects (not further specified); and *Stools positive for *S. enteritis* Sampling (specimen, frequency, duration): *Stools *Subgroup: t=0, 3, 7, 10, 14 wks post-infection; all: t=0 and 14 wks post-infection Lab method: Microbiological culture using standard methods

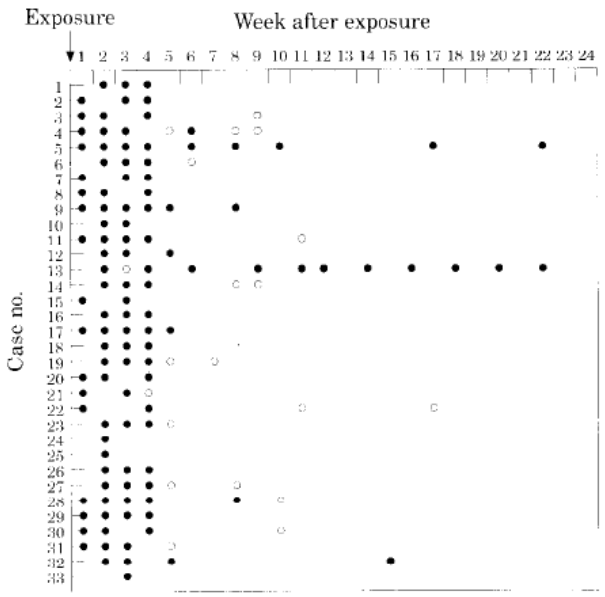
Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Proportion of patients with faecal *S. enteritis* excretion by week after infection Results: *Table. Percentage of positive patients by week after infection	Comments: *n=327 patients received antibiotics (penicillins, sulphonamides, cephalosporins, macrolides, or others) and for n=141 extra stool cultures were obtained. Antibiotic therapy did not affect fecal excretion of *S. enteritis* (weeks 0, 3, 7, 10, 14: 100%, 52%, 20%, 2%, 3%, respectively; % read from graph by Pallas) *In the text it says the graph shows data for 508 untreated patients, in the figure caption it says the figure shows data for 1227 untreated patients *Shedding calculated from moment of infection, not from disease onset Limitations: *Study population includes adults (4.5% of those that did not receive antibiotics) *Results presented here are for patients that did not receive antibiotics, these patients might differ from patients that did receive antibiotics (21%), e.g. in that their disease might have been more severe

Weeks after infection	Percentage positive
Week 0	100%
Week 3	50%
Week 7	14%
Week 10	7%
Week 14	3%

(% read from graph by Pallas)

NR: not reported; wks: weeks; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Balfour Journal: J Infect Pub Year: 1999 Aim: To review the excretion of *Salmonella* Enteritidis PT4 in the faeces of infants involved in a point-source outbreak in a nursery and to relate these findings to advice given by the Outbreak Control Team.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: NR	Setting: Nursery Source population: Children aged ≤5 years in a nursery in Scotland Inclusion criteria: *Ill ('case') *Laboratory confirmed *Salmonella* Enteritidis Sample: *n=33 cases; shedding was based on n=24 cases *Among all cases: <1 yr, n=4; 1-2 yrs, n= 5; 2-3 years, n=10; 3-5 yrs, n= 14. *Gender: NR	Disease/infectious agent: *Salmonella* Enteritidis PT4 Source: Quiche cooked with fresh shell eggs Case definition: *Ill ('case'); and *Microbiologically confirmed *S.* Enteritidis infection Sampling (specimen, frequency, duration): *Stool *Weekly for 4 weeks, longer for some Lab Method: NR

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Duration that *S. enteritidis* PT4 could be found in stool samples by time from exposure Results: *At least 4 weeks, some up to 22 weeks *Within 2 weeks of the lunch, 32/33 had been confirmed microbiologically. 24 children submitted the faeces 4 weeks from exposure, 23/24 remained positive. 12 children submitted the faeces 8 weeks from exposure, 5/12 were positive. Of these, 2 cases still excreted at week 22	*Figure. Convalescent fecal excretion of *S. enteritidis* in 33 children. Key: filled circle: *S. enteritidis* isolated. Empty circle: *S. enteritidis* not isolated.  	Comments: *After 4 weeks none of the cases that submitted faeces then (n=24) were still symptomatic *None received antimicrobial treatment *22/33 had diarrhoea, 2 of these also reported blood in the diarrhoea. The clinical features of the other cases were not known Limitations: *Duration of shedding not from onset of symptoms but from exposure *NR how much time there was between exposure and onset of illness *Initially, only symptomatic cases submitted feces and 2 successive negative feces were required before the child could return to the nursery. By 4 weeks from exposure, the policy changed and allowed symptomless cases to return to the nursery regardless of whether they were still excreting *Salmonella*. Due to this policy change, the submission of feces diminished and long-term follow-up was not available for all samples *Laboratory testing methods NR

NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Cowden Journal: Epidemiol Infect Pub Year: 1989 Aim: To investigate a sudden increase in the number of reports received by CDSC of *S.* Typhimurium DT 124 infections and identify the source of infection.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: December 1987 to February 1988	Setting: Countrywide Source population: Surveillance of laboratory reports from medical microbiology laboratories of the NHS and PHLS Inclusion criteria: **S.* Typhimurium DT infection as reported in weekly laboratory surveillance scheme *Primary cases Sample: *n=101 confirmed isolated; n=85 cases were interviewed; of these 72 were primary cases; incubation period was based on n=59 primary cases for whom dates of consumption and disease onset were known (16/85 were prescribed antibiotics) *Among the 85 cases, age range: 7 months-78 yrs; median age: 6 yrs; most were children *M/F-ratio: 46/39	Disease/infectious agent: *Salmonella* Typhimurium DT 124 Source: Salami sticks Case definition: *Primary cases: Persons who had had diarrhoea, the epidemic phage type isolated from their stools, and no other member of the family had previously had diarrhoea since 1 Dec, 1987. Sampling (specimen, frequency, duration): *Stools *NA Lab Method: Incubation and screening of colonies giving the appearance of *Salmonella* by testing with polyvalent and 04 *Salmonella antisera* and those giving a positive reaction were sent to Division of Enteric Pathogens for phage typing.

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time between the date of consumption of salami sticks and onset of symptoms Results: *Median: 1-3 days *<24 hours: n=5; 1-3 days: n=41; 4-7 days: n=11; >7 days: n=2	Comments: *Out of 72 primary cases, 68 had eaten a same type of salami stick. *81/85 reported diarrhoea, 35 reported blood in their stools, 38 reported vomiting and 71 fever; 2 cases developed complications. *First *Salmonella* outbreak with fermented meat product in the United Kingdom Limitations: * 22/85 were prescribed medication. Of these, 16 were prescribed antibiotics

M/F-ratio: male-to-female ratio; NA: not applicable; NHS: National Health Services; PHLS: Public Health Laboratory Service; CDSC: Communicable Disease Surveillance Centre ; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: El-Radhi Journal: Arch Dis Child Pub Year: 1992 Aim: To determine whether the observation that, among children with *Salmonella* gastroenteritis, those with a temperature greater than 40°C had a significantly shorter duration of bacterial excretion compared with afebrile children (from a study among 125 children in Kuwait), also holds for Finnish children with *Salmonella* gastroenteritis.	Country: Finland Study design: Case series Study period & duration: January 1974 to December 1990	Setting: Paediatric department of a hospital Source population: All children hospitalised at the paediatric department the Aurora hospital in Helsinki Inclusion criteria: *Gastroenteritis *Positive stool culture for non-typhoid *Salmonella* Exclusion criteria: *Illness commenced in foreign countries *Children who were referred to the hospital after the diagnosis had been established Sample: *n=102 *Mean age: 5.6 yrs (range 3 months-15.5yr) *52.9% male	Disease/infectious agent: Non-typhoid *Salmonella. S.* Typhimurium (n=60), *S. enteritidis* (n=18), other *Salmonella* (n=24) Case definition: *Acute gastroenteritis; and *Positive stool culture for non-typhoid *Salmonella* Sampling (specimen, frequency, duration): *Stools *Routine investigation during hospitalisation (frequency NR). After discharge, weekly. *Until bacteriological cure Lab method: Bacterial culture

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From admission to hospital until bacteriological cure (at least three successive negative cultures) Results: Mean (± SD) days of shedding from admission to hospital - *S.* Typhimurium: 5.4 weeks (± 6.2) - *S.* Enteritidis: 3.8 weeks (± 3.7) - Other *Salmonella*: 5.4 weeks (± 13.6)	Comments: *Duration of excretion did not significantly differ between different Salmonella types *None of the children received antibiotics specifically aimed at *Salmonella* infection. Nine children received penicillin and six other children received various other antibiotics at the acute stage of illness *Significant correlation was found between the duration of convalescent excretion and fever at the initial stage of illness. The shortest mean duration of excretion was found in children with high fever on admission and the longest was in afebrile children Limitations: *Duration of shedding not calculated from time of onset of symptoms *Duration of diarrhea before admission to the hospital was unknown

NR: not reported; SD: standard deviation; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Huang Journal: Pediatrics and Neonatology Pub Year: 2012 Aim: To investigate the clinical manifestations, microbiological features, complications, fecal excretion time, and response to treatment in young children <2 years of age with non-typhoid *Salmonellosis*.	Country: Taiwan Study design: Case series Study period & duration: January 2005 to December 2009	Setting: Hospital Source population: Pediatric patients admitted to the Kaohslung Veterans General Hospital in Southern Taiwan Inclusion criteria: *Fever or diarrhea with any symptoms/signs of dehydration or bloody stool *Positive cultures for non-typhoid *Salmonella* *Permission to be followed Sample: *Total study population of n=297 cases, of which n=45 agreed to be followed until two consecutive stool cultures demonstrated a negative result *Median age of all cases: 19 months (range 2 - 193 mo) *Gender of all cases: 58.9% male	Disease/infectious agent: S. enteritidis B, S. enteritidis D, S. enteritidis C1, S. enteritidis C2, S. enteritidis E, S. choleraesuis Case definition: *Diarrhea (decrease in consistency and an increase in the frequency of bowel movements to three stools per day); and *Positive culture for non-typhoid *Salmonella* Sampling (specimen, frequency, duration): *Stools *Prospective collection of repeated samples on the day of discharge and additional samples every 5-7 days *Sampling until two consecutive stool cultures were negative Lab method: Serotyped using Wellcolex color *Salmonella* test, confirmed by slide agglutination test using O antiserum

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From the first positive stool culture after admission to the hospital until the first of two consecutive negative results Results: Mean duration of shedding from first positive stool culture after admission to the hospital: 16.2 days Mean (± SEM) duration of shedding from first positive stool culture after admission to the hospital <2 yrs (n=23): 19.9 days (± 5.8) ≥2 yrs (n=22): 12.3 days (± 1.9)	Comments: *Mixed infections in 44 patients (*Aeromonas sobria; A. hydrophila*; rotavirus) *Mean (± SEM) duration of diarrhea before admission <2 yrs: 2.5 days (± 0.2) ≥2 yrs: 2.3 days (± 0.2) *Patients were discharged when afebrile for >24 hours and when the symptoms/signs of dehydration had resolved Limitations: *22 patients (7.4%) have underlying diseases *56% of the children were treated with antibiotics: <2 yrs: 111/179 ≥2 yrs: 56/118 The decision to administer antibiotic treatment was at the discretion of the attending physician, with no input from the authors *Duration of shedding not measured from time of onset of symptoms

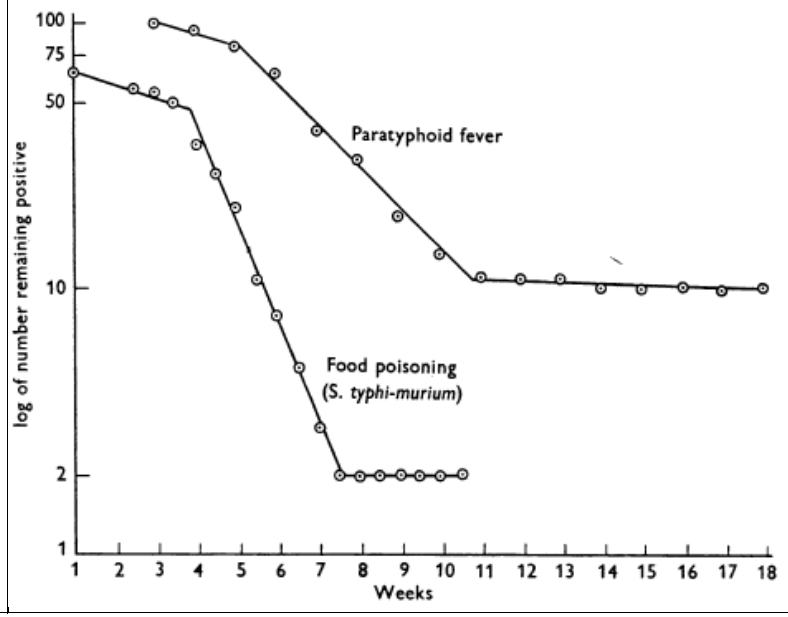
Mo: months; SEM: standard error of the mean; Yrs;: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Kazemi Journal: J Pediatrics Pub Year: 1973 Aim: To evaluate the role of antibiotics in the therapy of *Salmonella* gastroenteritis in children.	Country: Canada Study design: Randomized controlled trial Study period & duration: NR	Setting: Hospital Source population: Children seen in the outpatient department of Montreal Children's Hospital Inclusion criteria: *10 months - 15 yrs *Culture-proved *Salmonella* *History of diarrhea and fever for > 3 days and/or mucus and blood in diarrheal stools Exclusion criteria: *Antibiotics within five days *Renal or hepatic disease, blood dyscrasia, or *Salmonella* bacteremia *Poor follow-up Sample: *Total study population of n=36 cases, of whom n=12 were included in the placebo group *Age categories of cases in placebo group: 3-11 months: n=3 12 mo-3 yrs: n=5 >3 yrs: n=4 *Gender: NR	Disease/infectious agent: *S.* Typhimurium (n=6), *S.* Blockley, *S.* Newport (both n=2), S. Heidelberg, *S.* Enteritidis (both n=1) Case definition: *Gastroenteritis; and *Culture-proved *Salmonella* Sampling (specimen, frequency, duration): *Stools or rectal swabs *Daily for seven days (duration of therapy). Samples collected for two or three consecutive days at one week, eight weeks and six months after end of therapy Lab method: MacConkeys agar

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From start of study until negative stool cultures Results: Days after start therapy/end therapy — Proportion (%) isolations positive Seven days after start of therapy — 7/12 (58%) One week after end of therapy — 4/11 (36%) Eight weeks after end of therapy — 0/9 26 weeks after end of therapy — 0/12	Comments: *There were no significant differences in any of the clinical features measured (fever, diarrhea) and in the bacteriologic cure rates in the three groups (SMZ-TMP or ampicillin vs no therapy group) *Initiation of therapy in relation to onset of disease (days): range 2-10, mean 4.7 Limitations: *Duration of shedding not measured from time of onset of symptoms

NR: not reported; SMZ-TMP: Sulfamethoxazole and trimethoprim; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Lennox Journal: J Hyg (Lond) Pub Year: 1954 Aim: To describe an outbreak of *Salmonella* (source and duration of infection).	Country: NR, appears to be United Kingdom Study design: Outbreak investigation Study period & duration: Onset: February 5, 1954	Setting: School Source population: Pupils attending at a school during the outbreak Inclusion criteria: *Children with diarrhoea and abdominal pain Sample: *n=88 children with laboratory-confirmed infection; of whom n=64 were symptomatic. (a handful of the cases had been given chloramphenicol or any other chemotherapeutic drug) *Age range among notified cases: 6-9 yrs *Gender: NR	Disease/infectious agent: *Salmonella* Typhimurium Source: School milk Case definition: *Diarrhoea and abdominal pain; and *Positive result from stool culture Sampling (specimen, frequency, duration): *Stool *Twice a week from every child found positive until a series of negative results showed them to be free from infection Lab Method: NR

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Time between onset of symptoms until negative stool sample Results: *Range: 1-18 weeks *Median: 4.5 weeks (Number calculated by Pallas) *Max 7 weeks for almost all, 10 weeks n=1, 18 weeks n=1 *Of the 64 children who fell ill the numbers remaining positive at successive periods of half a week were 64, (56-64), (56-64), 56, 55, 50, 35, 27, 20, 11, 8, 5, 3, 2, 2, 2, 2, 2, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0	*Figure. Log of numbers remaining positive by week after onset of illness (for food poisoning)  	Comments: *The authors think that before laboratory confirmed, 8 cases cleared *S.* Typhimurium themselves. *64 children had diarrhea, abdominal pain (8 were negative of the stool culture at the time of testing), 24 children had no symptoms were tested positive Limitations: *A handful of the cases had been given chloramphenicol or any other chemotherapeutic drug

NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Matsui Journal: Epidemiol Infect Pub Year: 2004 Aim: To help determine source and other characteristics of a *Salmonella* outbreak.	Country: Japan Study design: Outbreak investigation Study period & duration: October 2001	Setting: Schools Source population: Residents of Toyohashi area Inclusion: *Resident in Toyohashi area *Became ill after September 1, 2001 *Had a stool culture positive for *S.* Enteritidis Sample: n=163 confirmed *S.* Enteritidis cases; of which n=95 were *S.* Enteritidis PT1 (for whom incubation period was calculated) *Median age of confirmed *S.* Enteritidis cases: 8 yrs; range: 8 months to 74 yrs; children in preschool or still at home, n=36; children in elementary school, n=110; children in junior high, n=3, and individuals in high school or older, n=14	Disease/infectious agent: *Salmonella* Enteritidis phage type1 Source: Dessert buns served at school lunch, which were probably crosscontaminated from eggs Case definition: *Residents of Toyohashi area who became ill after September 1, 2001 *Stool culture positive for *S.* Enteritidis Sampling (specimen, frequency, duration): *Stool *NA Lab Method: Culture, and serotyping

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time between consumption of dessert buns and illness Results: For 95 PT1 cases in the school outbreak: *Median: 8 days *Range: 3-16 days	Comments: *Authors believe that incubation period in this outbreak is accurate (little person-to-person transmission; consumption of dessert buns after the serving day was unlikely because this was prohibited by school teachers; environmental contamination from dessert buns was unlikely because the buns were wrapped), although it's much longer than usual *Authors could not determine the contamination level of the dessert buns from the one positive sample, but the contamination level was probably low and variable, causing a long and wide incubation period Limitations: NR

NA: not applicable; NR: not reported; PT1: phage type 1; SE: *Salmonella* Enteritidis

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Nelson Journal: Pediatrics Pub Year: 1980 Aim: To resolve the conflicting information on the role of antibiotics in uncomplicated *Salmonella* gastroenteritis by comparing orally administered placebo, ampicillin, and amoxicillin.	Country: United States Study design: Randomized, double-blind study Study period & duration: NR	Setting: Hospital Source population: Infants and children seen in the clinical facility of the Children's Medical Center in Dallas Inclusion criteria: *Acute diarrhea *Uncomplicated *Salmonella* gastroenteritis Exclusion criteria: *Clinical evidence of an extragastrointestinal site of infection *High fever or toxic appearance suggesting bacteremia *History of adverse reactions to penicillins *Another focus of infection such as otitis media or pneumonia *Less than 6 weeks of age Sample: *Total study population of n=45 children, of whom n=14 assigned to the placebo group *Mean (± SEM) age of cases in placebo group: 19.8 (± 7.4) months (range 2-96 months) *Gender of cases in placebo group: 50% male	Disease/infectious agent: *Salmonella* B (n=10), *Salmonella* C-1, C-2, D-1, E-1, F, G-2 (all n=1) Case definition: *Acute diarrhea **Salmonella* species isolated from rectal swabs cultures Sampling (specimen, frequency, duration): *Rectal swabs *Daily (collected by the parents) *Duration of sampling until two consecutive rectal swab specimens were negative for *Salmonella* Lab method: Eosin-methylene-blue agar, xylose-lysine-desoxycholate agar, and tergitol-7 agar

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: From start of the study until the first of at least two consecutive negative cultures Results: - Days of shedding until first of at least two negative culture Range: 1-111 days; mean (± SEM): 28.5 days (± 9.4); median: 12 days - Days of shedding until last positive culture Range: 1-77 days; mean (± SEM): 20.9 days (± 6.8); median: 11 days	Comments: *Mean (± SEM) days ill before start of the study: 9.3 days (± 1.4); range: 4-21 days *Difference in duration of shedding between placebo and treated (on or two antibiotics; ampicillin or amoxicillin) groups was not significant Limitations: *Duration of shedding not measured from time of onset of symptoms

NR: not reported; SEM: standard error of the mean.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Raguenaud Journal: Eurosurveill Pub Year: 2012 Aim: To describe the epidemiological and microbiological investigations undertaken to estimate the total number of cases involved in the outbreak of monophasic *Salmonella* Typhimurium 4,5,12:i:- in the schools of Poitiers and to describe their characteristics.	Country: France Study design: Outbreak investigation Study period & duration: Exposure on 19, 20 and 22 of October 2010. Data collected from October 19 to October 27, 2010	Setting: Three Junior high schools and a Senior high school Source population: Children attending one of the high schools in Poitiers Inclusion criteria: *Eaten the school meal on the day the incriminated beef was served *Reporting diarrhoea or fever with at least one digestive symptom, within five days after the incriminated school meal *Date and time of onset of illness reported Exclusion criteria: *Missing school information Sample: *n=1559 persons exposed, of whom n=554 were identified as clinical cases. Time of onset of symptoms reported by n=296 *Median age (IQR) of exposed persons; M/F-ratio School A: 13 yrs (11-13 yrs); 1.0 School B: 12 yrs (11-13 yrs); 1.0 School C: 12 yrs (11-13 yrs); 0.9 School D: 16 yrs (15-17 yrs); 2.3	Disease/infectious agent: *Salmonella Typhimurium 4,5,12:i:-* (R-type ASSuT) Source: Imported beef served at the schools Case definition: *Clinical case: -Reporting either: (i) diarrhoea within five days after school meal, or (ii) fever with at least one digestive symptom (nausea, vomiting or abdominal pain) within five days after school meal, or (iii) diarrhoea of unknown date of onset but within 15 days after the incriminated school meal, or (iv) fever with at least one digestive symptom and with unknown date of symptoms within 15 days after the school meal; or *Confirmed cases: -Met clinical case definition and had a positive stool culture for monophasic *Salmonella* Typhimurium 4,5,12:i:- as determined by the French National Reference Centre for Salmonella Sampling (specimen, frequency, duration): *Stools Lab method: Pulsed field gel electrophoresis and multi-locus variable-number tandem repeat analysis

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time from eaten the school lunch on the day the incriminated beef was served until onset of symptoms Results: Hours from exposure until onset of symptoms Range: 1 - 127 hours; median: 40 hours; IQR: 27-56 hours - School A: 49 hours; IQR: 43-69 hours - School B: 34 hours; IQR: 25-unknown - School C: 46 hours; IQR: 35-68 hours - School D: 39 hours; IQR: 30-70 hours	Comments: *The number of cases could be underestimated because of non-exhaustive study participation (response rate 78%), because of our assumption that all those who ate at the school consumed the beef, and because of errors in reporting disease onset for persons with clinical symptoms *The outbreak showed signs of severity with about half of the cases who sought medical care in a private practice or an emergency service, of which 31 of 554 (6%) were hospitalised for more than 24 hours *The infective dose was possibly greater in beef burgers served in School B than in other schools, in School C. Limitations: *1.8% of the cases were adults (≥20 yrs)

IQR: interquartile range; M/F-ratio: male-to-female ratio; R-type ASSuT: resistance to ampicillin, streptomycin, sulphonamides, tetracycline; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Sheu Journal: Zhonghua Yi Xue Za Zhi Pub Year: 1990 Aim: To investigate duration of shedding, complications, and treatment of Salmonellosis in young infants.	Country: China Study design: Retrospective study of 64 laboratory confirmed cases Study period & duration: January, 1985-December, 1988	Setting: Hospital Source population: Hospitalized children with gastroenteritis in a hospital during January, 1985-December, 1988 Inclusion criteria: Children who were diagnosed with Salmonellosis based on laboratory tests in a hospital during January, 1985-December, 1988 Sample: *n=64 (Duration of shedding was based on 24 cases): a handful of cases were given antibiotics *<3 months: 17, 3month-1year: 33, >1 year: 14 *35 males	Disease/infectious agent: *Salmonella* B: 42 cases, D1: 7 cases, C2: 6 cases, C1: 4 cases, E1: 1 case, E2: 1 case Case definition: *Based on medical records of diagnosis based on laboratory tests Sampling (specimen, frequency, duration): *Stool, blood; *More than once. Among 24 cases for calculating shedding, cultured more than twice. Lab Method: Stool and blood culture

Outcome definition, results	Comments, limitations
Outcome definition: Shedding duration is defined as "from the first positive sample to the first negative sample". A person needs to have 2 consecutive negative samples to be considered as no longer shedding the bacteria. The date of first negative sample was recorded as the end of shedding. Results: No antibiotics: <3 months: mean 12.1 day from first positive sample; 3 months-1 yr: 81.3 day	Comments: *Blood culture was done among 42 cases and 10 were positive *17 out of 24 were given antibiotics. -Among cases aged <3 months, duration of shedding for those who used antibiotics was 13.6 days. -Among cases aged 3 month to 1 year, mean duration of shedding for those who used antibiotics was 54.3 days. Total population: 4-180 days (mean 37.2 days) *Diarrhea: 90.6%, bloody stool: 70.3%, fever: 65.6%, upper respiratory symptoms such as cough (56.2%) and vomiting, abdominal pain. 10 had bacteremia and 1 was died Limitations: *No measure of variation given for stratified data; only n=7 did not receive antibiotics
NR: not reported; yr: year	

Typhoid fever (n=4)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Anita Journal: Med J Malaysia Pub Year: 2012 Aim: To investigate an outbreak of typhoid fever (to verify the outbreak, to identify the source and risk factors for infection, and to undertake immediate preventive and control measures).	Country: Malaysia Study design: Outbreak investigation Study period & duration: Exposure on January 27, 2009, investigation up to February 27, 2009	Setting: Sungai Congkak Recreational Park (SCRP) Source population: E-notis (communicable disease surveillance system); and medical records at health clinic nearby the park Inclusion criteria: *History of visiting SCRP *Met case definition Sample: *E-notis: n=12 cases Medical records: n=45 suspected cases, of whom n=39 were contactable, of whom n=14 had a history of visiting SCRP, none of their stool cultures grew *S.* Typhi *Age: n=11/12 cases are ≤12 yrs *50% male	Disease/infectious agent: *Salmonella* Typhi Source: River water contaminated with human waste at SCRP Case definition: *From e-notis: typhoid notification from January 27 to February 27, 2009; or *From medical records: patients who presented with fever and abdominal symptoms from January 26 to February 27, 2009 and had laboratory-confirmed *S.* Typhi Sampling (specimen, frequency, duration): *Blood or stools Lab method: Pulsed-field gel electrophoresis
Outcome definition, results			Comments, limitations
Outcome definition: Incubation period: time from January 27, 2009 to date of disease onset Results: Range: 4-20 days; median 18 days (± 5)			Comments: NR Limitations: *Age unknown for 1/12 cases
NR: not reported; SCRP: Sungai Congkak Recreational Park; yrs: years.			

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Galloway Journal: Arch Dis Child Pub Year: 1966 Aim: To describe the clinical features and management of cases in an outbreak.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: May 16 to July 31, 1964	Setting: Hospital Source population: Children admitted to Aberdeen hospitals, Scotland Inclusion criteria: *<12 years *Hospitalized for typhoid fever Sample: *n=86 cases of typhoid fever; incubation period was based on n=56 cases (for which the relevant exposure period was known): all were given chloramphenicol and/or ampicillin, after symptom onset *Age range: 1-12 yrs. 1yr, n=8; 2yrs, n=7; 3y, n=4; 4y, n=8; 5yrs, n=3; 6yrs, n=13; 7yrs, n=12; 8yrs, n=5; 9yrs, n=7; 10yrs, n=10; 11yrs, n=9; 12yrs, n=0 *M/F-ratio: 43/43	Disease/infectious agent: Typhoid Source: A tin of corned beef that contaminated the cooked meat counter of a supermarket Case definition: *Clinical manifestation: rose spots, usually scanty were the most valuable and single diagnostic sign; or clinical symptoms and *Contact history or positive blood/stool cultures Sampling (specimen, frequency, duration): *Blood, stool *NA Lab Method: Culture

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time from consumption of infected meat until first symptoms Results: *Range: 5-34 days *< 8 days: 3 cases, 8-14 days: 25 cases, 15-21 days: 22 cases, 22-28 days: 4 cases, >28 days: 2 cases The incubation periods in 2 cases recorded as >28 days must be regarded as doubtful: both periods are calculated from dates on which they undoubtedly ate meat from the primary source, but each child was subsequently in contact with a proved case of the disease, and it is perhaps more likely that both were secondary cases with short incubation periods rather than primary cases.	Comments: *58 cases were positive for blood culture and typhoid bacilli was isolated in stool samples among 41 cases *Incubation data do not include n=30 patients who are denoted as uncertain (source of infection unknown n=10, food bought from the shop on several occasions n=20) Limitations: *Chloramphenicol or ampicillin, or both drugs in sequence, were given upon hospital admission in every case, the primary course of treatment lasting 14 days except in 5 cases in which the course was extended for a max of 25 days

M/F-ratio: male-to-female ratio; NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Taylor Journal: Am J Epidemiol Pub Year: 1974 Aim: To describe a nationwide outbreak of typhoid fever.	Country: Trinidad Study design: Outbreak investigation Study period & duration: May 1971	Setting: Countrywide Source population: Laboratory and hospital records of persons hospitalized with suspect typhoid fever in Port of Spain, Sangre Grande, and San Fernando, Trinidad; and Scarborough, Tobago Inclusion criteria: *Patients with positive cultures or a clinical presentation compatible with typhoid fever associated with an O antibody titer greater than 1:100 Sample: *n=132 culture-positive cases of typhoid fever; of which n=31 were in Port of Spain (with known date of exposure) *Age among all culture-positive cases: 80% were 5-14 years; age in Port of Spain: 85% were children *M/F-ratio among the children aged 5-14 yrs: 36/66	Disease/infectious agent: *Salmonella* Typhi, phage type A Source: Ice cream probably contaminated by an employee in the plant Case definition: *Met criteria for typhoid fever; and *Positive cultures Sampling (specimen, frequency, duration): *Stool *NA Lab Method: Culture, isolation and identification of *S.* Typhi, and phage typing

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Interval between exposure to the contaminated ice cream (March 23) and onset of disease Results: *Mean: 19.25 days *Median: 19 days	Comments: *Cultures identified as *S.* Typhi in San Fernando and Port of Spain were sent to the US CDC for confirmation and phage typing. *In samples of ice cream obtained a month after the outbreak *Escherichia coli* was highly positive. *The authors state that the prolonged incubation time in port of Spain (of whom 85% were children, which tend to have shorter incubation times than adults) supports the hypothesis of a low level contamination in all pallets (instead of a few heavily contaminated pallets) of ice cream Limitations: *15% were adults

NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Usera Journal: Eur J Epidemiol Pub Year: 1993 Aim: To report a large community outbreak in a Public school in Madrid.	Country: Spain Study design: Outbreak investigation Study period & duration: Exposure on June 5 or 6, 1991. Data collected on cases from June 11 to July 8, 1991	Setting: School Source population: Students and teachers at the public school of Móstoles, Madrid Inclusion criteria: *Ate regularly at the restaurant during the suspected period *Infected with *Salmonella* Typhi *Follow-up until a negative stool culture Sample: *n=54 confirmed patients, n=48 were followed-up until their stool cultures were negative *Age among children that normally ate at the school restaurant: 4-15 yrs *47% male	Disease/infectious agent: *Salmonella* Typhi phagetype 34, biotype Xylose+ and Tetrationate Reductase + Source: Salad or custard served at the school restaurant Case definition: *Having clinical symptoms **Salmonella* Typhi strains isolated from blood and/or faeces Sampling (specimen, frequency, duration): *Stools *Frequency: NR *Follow-up until stool cultures were negative; total of 168 stool samples Lab method: MAC non-lactose fermenting colonies which biochemically fit *Salmonella* species
Outcome definition, results			Comments, limitations
Outcome definition: Duration of shedding: From date of clinical cure to negative stool culture Results: All stool samples were negative four months after being clinically cured			Comments: NR Limitations: *Duration of shedding not measured from time of onset of symptoms but from time of clinical cure *NR how long from onset of symptoms until clinical cure *Information on date of onset of illness available for only 38 confirmed cases *Small number of teachers included in study group *All cases were treated (amoxicillin, ampicillin followed by amoxicillin or Trimethoprim/Sulfamethoxazol)
NR: not reported; yrs: years.			

Paratyphoid fever (n=0)

Shigella infections (n=5)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Haltalin Journal: J Pediatr Pub Year: 1967 Aim: To define the role of antimicrobial therapy by carrying out a double-blind study in infants and children hospitalized for shigellosis, comparing sulfadiazine, ampicilin, and placebo.	Country: United States Study design: RCT Study period & duration: July 1964 to December 1965	Setting: Hospital Source population: Infants and children admitted to Parkland Memorial Hospital Inclusion criteria: *Admitted for shigellosis *Satisfied certain criteria (not further specified) Exclusion criteria: *Age <6 weeks *History of allergy to penicillin or sulfanomides *Presence of another significant disease process requiring specific therapy *Received antibiotics prior to admission *A few otherwise eligible patients were unsuitable for study because antibiotics were arbitrarily administered on admission *Another pathogen (e.g. enteropathogenic *E. coli* or *Salmonella spp.*) in addition to *Shigellae* Sample: *n=52 patients enrolled, of whom 16 were randomized to the placebo group, of these n=6 patients were removed from the study and placed on other drugs so n=10 patients were included *Age among patients in placebo group: 0-6 months: n=2; 6 months to 2 yrs: n=6; 2-5 yrs: n=7; >5yrs: n=1 *M/F-ratio in placebo group: 10/6	Disease/infectious agent: *Shigella flexneri (1b, 2a, 2b, 3, 3a, 3b, 4a); S. sonnei; S. dysenteriae* (n=11, n=5 and n=0 in placebo group, respectively) Case definition: *Patients with shigellosis who satisfied certain criteria (not further specified); and *Organisms suspected to be *Shigellae* were found in admission stool cultures Sampling (specimen, frequency, duration): *Rectal swabs *Daily as long as patients were hospitalized Lab method: Culture

Outcome definition, results	Comments, limitations
Outcome definition: *Duration of shedding: Mean number of day until stools negative for *Shigellae* (excluding patients removed from study and placed on other drugs); likely measured from start of therapy Results: Range: 1-10 days from start of therapy; mean: 5.0 days from start of therapy	Comments: *Mean duration of illness before therapy began: 0-2 days: n=4; 2-7 days: n=9, >7 days: n=3 *n=18 patients were randomized to the sulfadiazine group (of whom n=4 were removed from the study) and n=18 to the ampicillin group. Days until stools negative for *Shigellae* significantly different from placebo group (p<0.02) (in sulfadiazine group range: 1-9, mean: 2.8; in ampicillin group 1-4 days, mean 1.9.) Limitations: *Measurement of duration of shedding by day of treatment, not day of disease onset

e.g.: exempli gratia; M/F-ratio: male-to-female ratio; RCT: randomized controlled trial; yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Haltalin Journal: Amer J Dis Child Pub Year: 1972 Aim: To investigate the clinical and bacteriologic effectiveness of ampicillin in outpatients with shigellosis. Secondary aims of the study were: (1) to document the bacterial causes of acute diarrhea in a socioeconomically disadvantaged population during peak periods of diarrhea; (2) to determine the efficacy of ampicillin in patients excreting enteropathogenic serotypes of *E. coli* and *Salmonella* species; (3) to investigate the effect of ampicillin in patients from whom no pathogens were isolated; and (4) to contrast clinical findings among the various etiologic groups.	Country: United States Study design: Double-blind placebo-controlled treatment study Study period & duration: Two study periods: from June 9 to November 5, 1969 and from April 7 to November 18, 1970	Setting: Children's Medical Center Source population: Infants and children seen at the outpatient department of Children's Medical Center, Dallas Inclusion criteria: *>3 months *Having acute diarrheal disease not requiring hospital admission *Infected with *Shigella* Exclusion criteria: *Antibiotics given for the present illness or during the preceding two weeks *Any associated illnesses requiring antibiotic therapy *History of allergy to penicillin or its derivatives Sample: *Total study population infected with *Shigella* n=101, of whom n=50 assigned to placebo group *Age categories 3-6 months: 4% 6-12 months: 10% 12-24 months: 28% 2-4 yrs: 46% ≥5 yrs: 12% *58% male	Disease/infectious agent: *S. sonnei, S. flexneri* Case definition: *Acute diarrhea; and **Shigella* pathogen isolated from rectal swab culture Sampling (specimen, frequency, duration): *Rectal swabs *Collected at two clinical visits (scheduled in 1 week) and at one return visit (scheduled one week after the last clinical visit) *Maximum duration of sampling 10 days Lab method: *Salmonella-Shigella* agar; identification of growth done by standard biochemical and slide agglutination techniques

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: Calculated from admission to study Results: Negative culture >48 hours after start of the study: 33/47 (70%) Culture positive after 5 days: 22/42 (52%) Culture positive >10 days after start to the study: 20/41 (49%)	Comments: *The proportion of children shedding *Shigella* differed significantly between the treated (Ampicillin) and placebo group at all three time points *Duration of illness before initial clinic visit: <1 day: 26% 2 days: 20% 3 days: 14% 4-7 days: 30% >8 days: 10% Limitations: *Three patients in the placebo group had the 'drug' discontinued because of worsening symptomatology, one required admission to the hospital, and five were treated with an antibiotic at the completion of therapy *Duration of shedding not measured from time of onset of symptoms

yrs: years.

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Keene Journal: N Engl J Med Pub Year: 1994 Aim: To identify the extent of the *E. coli* outbreak, the source of infection and the means of control.	Country: United States Study design: Outbreak investigation Study period & duration: July 1 to August 20, 1991	Setting: Lakeside park Source population: Patients identified through routine surveillance reports or through follow-up of these and other reports to local health departments, in Portland Inclusion criteria: *Residents of the four-county Portland area *Reported *E. coli* O157:H7 infection *Onset of illness from July 1 to August 20, 1991 Sample: *n=38 case patients with park-associated *S. sonnei* infections (28 confirmed by stool culture) *Median 6 years; range 1-32 yrs; most were children *Gender: NR	Disease/infectious agent: *Shigella sonnei* Source: Lake water was the most likely vehicle for the transmission Case definition: *Park-associated case patients: subjects whose symptoms began 1-4 days after visiting the park; and *Positive stool culture for *Shigella sonnei* or diarrheal illness and a household contact who was culture positive for *S. sonnei*. Sampling (specimen, frequency, duration): *Stools *NA Lab Method: Stool culture. Isolates were identified by standard methods (manual of clinical microbiology, 1991).

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Time between visit of the park and onset of symptoms Results: *Median: 2 days	Comments: *Persons whose symptoms began ≥2 days after another household member's illness were considered possible secondary case patients and were excluded from the analysis *Source of infection was fecally contaminated lake water Limitations: NR

NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Makintubee Journal: Am J Public Health Pub Year: 1987 Aim: To report an investigation of an outbreak of shigellosis that was epidemiologically linked to swimming in a contaminated reservoir.	Country: United States Study design: Outbreak investigation Study period & duration: June 7-28, 1982	Setting: Community Source population: Cases identified from local physicians, laboratories and hospitals in the counties near the Konawa water reservoir, Oklahoma Inclusion criteria: *Visited Konawa Reservoir *Stool culture positive for *Shigella sonnei* or diarrhea with fever and/or abdominal cramps during the month of June Sample: *n=85 questionnaires from persons who visited the lake; n=76 swam; of whom n=38 became ill; of whom n=22 had a single exposure to the lake *Median age of the n=38 ill swimmers: 9 yrs *Gender: NR	Disease/infectious agent: *Shigella sonnei* Source: Swimming in contaminated Konawa Reservoir Case definition: *Diarrhea (≥3 unformed stools in a day) with fever and/or abdominal cramps during the month of June; or clinical symptoms and *Stool culture positive for *Shigella sonnei* during the month of June Sampling (specimen, frequency, duration): *Stool *NA Lab Method: The specimens were cultured by standard techniques for *Salmonella, Shigella*, and *Campylobacter*.

Outcome definition, results	Comments, limitations
Outcome definition: Incubation period: Interval between exposure to the lake and onset of symptoms, for people with a single exposure to the lake Results: Range: 1-6 days Mean: 2.3 days	Comments: *Of 24 cases with a stool culture performed, 12 were positive for *Shigella sonnei* Limitations: * Age range NR, therefore possible that the study also contains adults

M/F-ratio: male-to-female ratio; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Tauxe Journal: Am J Public Health Pub Year: 1986 Aim: To examine the efficacy of different control strategies applied to simultaneous outbreaks of shigellosis in 2 day care centers	Country: United States Study design: Outbreak investigation Study period & duration: Outbreaks started in September 1983 (and lasted 21 and 34 days)	Setting: Day care centers Source population: Children and staff at the two day care centers, in Seattle, Washington Sample: *Center A: 80 children, 16 staff members; Center B: 23 children, 3 staff members. *S. sonnei* isolated from 24 children, staff and family members associated with the 2 centers. The yield of cultures among persons meeting the case definition was 63%. *Age: NR *Gender: NR	Disease/infectious agent: *Shigella sonnei* Case definition: *Illness with diarrhea (≥3 loose stools in a 24-hour period) or with fever and abdominal pain or vomiting, occurring between September 5 and October 4. A child was considered to have diarrhea if either a parent or a day care employee reported it; or clinical symptoms and **Shigella* isolated Sampling (specimen, frequency, duration): *Stools *NA Lab Method: Standard techniques

Outcome definition, results	Comments, limitations
Outcome definition: Exclusion period: Exclusion, isolation or closure until 2 negative successive stool cultures. The culture survey of 29 non-isolated children at center A, conducted 2 weeks after the establishment of the isolation room, identified 3 culture-positive children. 2/3 had had mild untreated diarrheal illness in September, and were counted as cases. 1/3 was an asymptomatic carrier. All 3 were ≥4 yrs of age; all were subsequently given antimicrobials without placing them in isolation. In both centers hand washing and careful cleansing of the diaper-changing area was stressed. A stool culture was obtained from each staff person; staff with diarrhea or a positive culture were excluded from work. Both day care centers were closed to new enrolment and symptomatic children were excluded. Parents were instructed to take their child to a physician for a stool culture if diarrhea developed, to use careful hygiene in the home, and not to place a child who had had diarrhea in any day care facility until 2 successive stool cultures were negative. Center A: Beginning October 3, 1983, an additional element in the control strategy was implemented. Children and staff with diarrhea from whom *Shigella* was isolated were allowed to return to the center of appropriate antimicrobial therapy after their diarrhea had ceased, but before negative follow-up cultures had been obtained; they were isolated in a separate room with its own bathroom, sink, and playground until all had had 2 negative stool cultures (21 days). Center B: *Shigella* had been isolated from the director and her 2 children, and the 2 other employees had diarrhea. The center closed voluntarily on October 4, 1983 and remained closed until the director and her family had had 2 successive negative stool cultures after antimicrobial therapy (34 days). Results: Transmission ceased at both centers within 2 days after intervention, and the outbreak did not spread to the rest of the community."	Comments: *Providing convalescent day care in isolation to children under therapy may offer several advantages compared to the strategies of closing the center, or of excluding ill children until they are culture-negative (less social impact as need for alternate day care was less; convalescent staff could return to work without waiting for negative cultures; may decrease contact between infected children and other children inside or outside center; parents have additional incentive to seek treatment if it permits them to return their children to day care sooner; treatment children receive can be documented and supervised; obtaining follow-up cultures simplified because the persons to be cultured are all in one place; strategy well received by parents of non-ill children; when a day care facility is closed or culture-positive convalescent children are excluded, infected children may often be cared for in a variety of settings even if they do not return to licensed day care, which may increase likelihood of spread of infection to community and other day care centers). *It is not clear that all convalescent children require isolation; they are likely to be culture-negative within days of starting appropriate antimicrobial therapy *Antimicrobial therapy itself may not be essential if careful isolation can be maintained. *The epidemiologic role played by asymptomatic *Shigella* excretors unknown, and it is not clear that they should be isolated. Limitations: *Several intervention strategies at once (including antimicrobial therapy)

NA: not applicable; NR: not reported; yrs: years

Parasitic infections

Giardiasis (n=1)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Bartlett Journal: Am J Public Health Pub Year: 1991 Aim: To assess the effectiveness of a strategy in comparison with other strategies for control of *Giardia lamblia* infection among infants and toddlers in Phoenix day care centers.	Country: United States Study design: Prospective randomized (unblinded) controlled trial Study period & duration: October 1986 to September 1987	Setting: Day care centers (DCC) Source population: Infants and toddlers with *Giardia lamblia* attending DCC in Phoenix Inclusion criteria: *Centers having a case of *Giardia lamblia* Exclusion criteria: *Centers who declined to participate Sample: *31 centres; 4180 infant-toddle child-months of observation *Age: 0-35 months *Gender: NR	Disease/infectious agent: *Giardia lamblia* Case definition: *Stools looser and more frequent than normal for that child; and *Stool sample positive for *Giardia lamblia* Sampling (specimen, frequency, duration): *Stools *At 1, 2, 4, and 6 months Lab method: Ethyl-acetate-formalin concentration of the formalin-preserved stool, followed by staining with D'Antoni's modified iodine and direct microscopic examination at lOOx and 400x magnification

<table>
<tr><th>Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td>
Exclusion period:

Group 1: Exclusion and recommendation of treatment for symptomatic and asymptomatic infections. Readmission after completion of treatment, and two Giardia-negative stool examinations by the health department (existing strategy).
Group 2: Exclusion and recommendation of treatment for symptomatic infections only. Readmission when asymptomatic, with continued treatment and follow-up testing in the center. No exclusion or treatment of asymptomatic infections.
Group 3: Exclusion and recommendation of treatment for symptomatic infections. Readmission when asymptomatic, with continued treatment and follow-up testing in the center. Treatment and follow-up testing of asymptomatic infections in the center, without exclusion.

Outcome: Comparing the prevalence of Giardia among infants and toddlers at 1, 2, 4, and 6 months after intervention and occurrence of Giardia-positive diarrhea among infants and toddlers during intervals between follow-up prevalence test rounds.

Results:
*Table. Prevalence of Giardia Lamblia in study DCC
<table>
<tr><th>Intervention groups</th><th>Initial</th><th>1 mo</th><th>2 mo</th><th>4 mo</th><th>6 mo</th></tr>
<tr><td>1</td><td>20% (6-32%)</td><td>8%</td><td>8%</td><td>8%</td><td>7%</td></tr>
<tr><td>2</td><td>18% (8-30%)</td><td>12%</td><td>12%</td><td>10%</td><td>8%</td></tr>
<tr><td>3</td><td>22% (5-47%)</td><td>7%</td><td>11%</td><td>8%</td><td>8%</td></tr>
</table>
*Table. Episodes of Giardia-positive diarrhea in study infants and toddlers between follow-up test rounds
<table>
<tr><th>Intervention group</th><th>Number of Giardia-positive episodes</th></tr>
<tr><td>1</td><td>6 (10%)</td></tr>
<tr><td>2</td><td>29 (16%)</td></tr>
<tr><td>3</td><td>16 (20%)</td></tr>
</table>
</td><td>
Comments:
*No control strategy was associated with significantly lower prevalences of Giardia among infants and toddlers in study centers, although the six-month prevalences in all three groups were significantly lower than the prevalences at the time of intervention

Limitations:
*No clear description of study population
*Time of exclusion not mentioned
</td></tr>
<tr><td colspan="2">DCC: day care centers; mo: month; NR: not reported.</td></tr>
</table>

Airborne diseases (n=20)

Influenza (n=8)

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr><td>Author: Brocklebank

Journal: Lancet

Pub Year: 1972

Aim: To describe the range of clinical illnesses, methods of diagnosis, and duration of virus excretion, for children admitted to the hospital with influenza A virus during the 1971-72 epidemic</td><td>Country: United Kingdom

Study design: Case series

Study period & duration: December 14, 1971 to March 7, 1972</td><td>Setting: Hospital

Source population: Children admitted to Newcastle and Gateshead hospitals

Inclusion criteria:
*Admitted to hospital with respiratory symptoms or febrile convulsions
*Influenza A infection
*Stayed in hospital for ≥2 days

Sample:
*n=77 influenza A infections (n=61 admitted to hospital and n=16 infected while in hospital), second secretions taken from n=15 children who were admitted to the hospital
*58% of influenza A infections in children <2 yrs
*Gender: NR</td><td>Disease/infectious agent: Influenza A, Hong Kong variant

Case definition:
*Respiratory illness or convulsions or infection while in hospital for other conditions; and
*Evidence of influenza A infection

Sampling (specimen, frequency, duration):
*Nasopharyngeal secretions
*Twice (on day of admission and day 3, 6, 7, 8 or 9)

Lab method: Isolation and fluorescent-antibody technique</td></tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td colspan="3">Outcome definition:
Length of excretion of influenza A (positive by either fluorescent-antibody technique or isolation). NB: all children only measured twice, once for diagnosis and one follow-up sample

Results:
*Table. Proportion positive by day since admission to hospital
<table><tr><th>Days since admission</th><th>Proportion positive by either technique* among all those sampled**</th></tr><tr><td>Day of admission</td><td>15/15</td></tr><tr><td>Day 3</td><td>1/1</td></tr><tr><td>Day 6</td><td>2/2</td></tr><tr><td>Day 7</td><td>4/8</td></tr><tr><td>Day 8</td><td>2/3</td></tr><tr><td>Day 9</td><td>1/1</td></tr><tr><td>Total positive on second sample</td><td>10/15</td></tr></table>*Fluorescent-antibody technique or isolation fluorescent-antibody technique or isolation
**NB: all children only measured twice, once at diagnosis and one follow-up sample</td><td>Comments:
NR

Limitations:
*Only two samples per child, taken on different days
*10 of the secondary samples were positive by at least one of the techniques that were used; 7 of the children were said to excrete for 7 or more days, but it is not known if the samples taken on days 3 and 6 would have turned out positive had there been a third sample; also it is unknown how for long those positive continue excretion.
*Duration of shedding from time of admission, not from time of symptom onset
*NR for how long children had symptoms prior to admission</td></tr>
<tr><td colspan="4">NB: nota bene; NR: not reported; yrs: years</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Frank Journal: J Infect Dis Pub Year: 1981 Aim: To describe naturally acquired infections over a 4-yr period in children with mild to moderately severe illness.	Country: United States Study design: Prospective follow-up study Study period & duration: 1975 to 1979 (Influenza A), 1977 and 1980 (Influenza B)	Setting: Households Source population: Participants in the Houston Family Study (racially and socioeconomically mixed group residing in the Houston area) Inclusion criteria: *Families enrolled with the birth of a new infant *Influenza A or influenza B infection Sample: *n=70 families, including 80-100 children were followed at any one time. Influenza A illness: n=50 episodes (41 individual cases) Influenza B illness: n=14 episodes (14 individual cases) *Influenza A: children <4 years (except 2 children aged 6 yrs) Influenza B: children 0.5-10 yrs *Gender: NR	Disease/infectious agent: Influenza A, Influenza B Case definition: *Illness (not further specified); and *Virus-proven Sampling (specimen, frequency, duration): *Nasal washes or throat swabs *Weekly or biweekly, whether or not the child was ill; and additional specimens sometimes obtained due to presence of illness (in child or family member). For Influenza B in 1980 only: 2-3 times per week Lab method: CPE, hemadsorption, indirect immunofluorescence

Outcome definition, results

Outcome definition:
Duration of shedding: Shedding during time between sampling (at set intervals) and onset of disease. Only isolates obtained <9 days before the onset were considered to be related to the subsequent illness and up to 40 days after onset of illness.

Results:
*Table. Proportion of positive samples by day of onset of symptoms for influenza A and B

	Influenza A		Influenza B	
Days from onset of symptoms	Positive samples/ total samples	% positive samples	Positive samples/ total samples	% positive samples
Days -5 to -8	1/22	5%	0/9	0%
Days -1 to -4	3/15	20%	0/4	0%
Days 0 to 3	32/43	74%	23/29	79%
Days 4 to 7	19/27	70%	19/28	68%
Days 8 to 11	2/20	10%	15/36	42%
Days 12 to 15	1/19	5%	5/23	22%
Days 16 to 19	0/23	0%	0/27	0%
Days 20 to 23	0/25	0%	0/18	0%
Days 24 to 27	0/16	0%	0/13	0%

*Figure 1. Positive and negative cultures in relation to the onset of influenza B virus-associated illness, 1975-1979

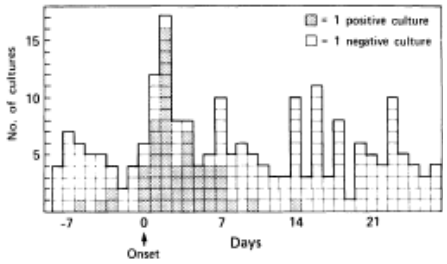
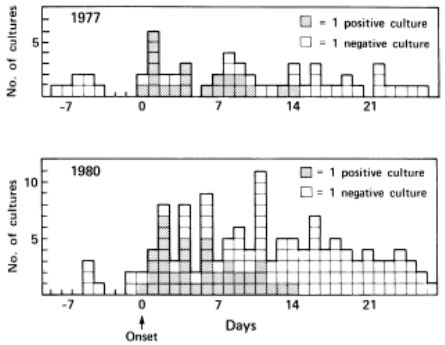


*Figure 2. Positive and negative cultures in relation to the onset of influenza B virus-proven illness: (top) the outbreak of 1977, analyzed retrospectively, and (bottom) cultures from 15 persons in five families followed prospectively during the outbreak of 1980.



Comments, limitations

Comments:
NR

Limitations:
NR

CPE: cytopathic effect; NR: not reported; yrs: years

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr><td>Author: Hall

Journal: Pediatrics

Pub Year: 1975

Aim: To study virologically patients with intercurrent fevers.</td><td>Country: United States

Study design: Outbreak investigation

Study period & duration: One month, April 1974</td><td>Setting: Hospital

Source population: Hospitalized children

Inclusion criteria:
*Children on the infants' ward with intercurrent fevers or admitted with acute lower respiratory tract infection

Sample:
*n=14 infants positive for influenza A, of whom n=7 with repeated measurements
*Age: ≤2 yrs
*Gender: NR</td><td>Disease/infectious agent: Influenza A H3N2; Port Chalmers/73

Case definition:
*Intercurrent fevers or admitted with acute lower respiratory
*Laboratory-confirmation of influenza infection

Sampling (specimen, frequency, duration):
*Nasal wash cultures
*Repeated at one or more weeks

Lab Method: Cell cultures</td></tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td colspan="3">Outcome definition:
Duration of shedding: Isolation of virus from time of occurrence of fever or of hospital admission

Results:
*Range: <7-21 days from occurrence of fever or hospital admission
<table><tr><th>Days</th><th>Number of children</th></tr><tr><td><7 days</td><td>n=1</td></tr><tr><td>7 days</td><td>n=3</td></tr><tr><td>9 days</td><td>n=1</td></tr><tr><td>12 days</td><td>n=1</td></tr><tr><td>21 days</td><td>n=1</td></tr></table></td><td>Comments:
NR

Limitations:
*Sampling frequency is unclear
*Unclear from and until what time point shedding was measured
*Infants had underlying cardiorespiratory disease</td></tr>
<tr><td colspan="4">NR: not reported; yrs: years</td></tr>
</table>

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr>
<td>Author: Hall

Journa l: J Infect Dis

Pub Year: 1979

Aim: To determine the quantitative shedding patterns of influenza B viral infection.</td>
<td>Country: United States

Study design: Case series

Study period & duration: NR</td>
<td>Setting: Ambulatory care facility

Source population: Children seen at the Elmwood Pediatric Group (a private pediatric group practice)

Inclusion criteria:
*Children presenting with acute respiratory diseases (of ≤24 hrs duration)

Exclusion criteria:
*Children living outside the county
*Those judged to have a bacterial disease

Sample:
*n=58 patients studied, n=43 proved to have influenza B infection
*Among those with influenza B infection: Mean age: 8 yrs, range: 4 months to 18 yrs
*Among those with influenza B infection: 53% male</td>
<td>Disease/infectious agent: Influenza B

Case definition:
*Typical febrile influenza-like illness (afebrile infection of the upper respiratory tract, croup (acute laryngotracheo-bronchitis), leg pain); and
*Positive for influenza B

Sampling (specimen, frequency, duration):
*Nasal wash
*Daily (mean 4 days)

Lab method: HAI</td>
</tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr>
<td colspan="3">Outcome definition:
Duration of shedding: Proportion of patients shedding influenza B virus according to day of illness

Results:
*Table. Proportion of patients who shed virus by day of illness.
<table>
<tr><th>Day of illness</th><th>Number of shedders/ number tested</th><th>% of shedders</th></tr>
<tr><td>Day 1</td><td>42/43</td><td>98%</td></tr>
<tr><td>Day 2</td><td>39/41</td><td>95%</td></tr>
<tr><td>Day 3</td><td>37/40</td><td>93%</td></tr>
<tr><td>Day 4</td><td>22/30</td><td>73%</td></tr>
<tr><td>Day 5</td><td>3/7</td><td>43%</td></tr>
<tr><td>Day 6</td><td>1/7</td><td>14%</td></tr>
</table>
</td>
<td>Comments:
NR

Limitations:
NR</td>
</tr>
<tr><td colspan="4">HAI: hemagglutination inhibition assay; hrs: hours; NR: not reported; yrs: years</td></tr>
</table>

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr>
<td>Author: Hall

Journal: J Pediatr

Pub Year: 1978

Aim: To better understand the recovery process of infants with lower respiratory tract disease due to RSV, the production of interferon by children with RSV infection was compared to that of children with influenza and children with parainfluenza virus infection.</td>
<td>Country: United States

Study design: Case series

Study period & duration: 1973 to 1976</td>
<td>Setting: Hospital

Source population: Patients with acute respiratory disease who were hospitalized or seen as outpatients (NB: all influenza patients were hospitalized)

Inclusion criteria:
*Disease proven to be due to influenza A, RSV, or parainfluenza type 1

Sample:
*n=20 patients with influenza, shedding data available for n=8 of them
*Age range for the 20 patients with influenza: <24 months
*Gender: NR</td>
<td>Disease/infectious agent: Influenza A

Case definition:
*Lower respiratory tract infection; and
*Influenza isolated from nasal wash.

Sampling (specimen, frequency, duration):
*Nasal wash
*On admission and approximately every other day throughout hospitalisation
*Median duration of influenza hospitalisation: 3.5 days

Lab method: Hemadsorpriton and hemagglutination inhibition testing</td>
</tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr>
<td colspan="3">Outcome definition:
Duration of shedding: Percent of patients who shed influenza virus by day of hospitalisation

Results:
Table. % of patients who shed influenza virus by day of hospitalisation
<table>
<tr><th>Day of hospitalisation</th><th>% of patients who shed influenza virus*</th></tr>
<tr><td>Day 1</td><td>100%</td></tr>
<tr><td>Day 2</td><td>98%</td></tr>
<tr><td>Day 3</td><td>60%</td></tr>
<tr><td>Day 4</td><td>48%</td></tr>
</table>
*% read from graph by Pallas</td>
<td>Comments:
*Beyond day 4 too few patients remained for valid correlations between viral shedding and interferon, therefore data not shown

Limitations:
*Unclear if (and if so, how) the 8 patients with follow-up data were selected in any way
*Duration of shedding not measured from time of disease onset (NB: from the figure caption it appears that the data is measured "by day of hospitalisation"; however the accompanying text suggests that the data is measured "during the first four days of illness")
*Duration of symptoms before hospitalisation NR</td>
</tr>
<tr><td colspan="4">NB: nota bene; NR: not reported; RSV: respiratory syncytial virus; yrs: years</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Jackson Journal: BMJ Open Pub Year: 2013 Aim: To review the effects of school closures on pandemic and seasonal influenza outbreaks.	Country: Worldwide Study design: Systematic literature review Study period & duration: Search performed in January 2012, up until the end of 2011	Setting: Schools Source population: Medline and Embase; In addition, Eurosurveillance (23 April 2009 to 15 December 2011), Morbidity and Mortality Weekly Report (24 April 2009 to 23 December 2011) and Emerging Infectious Diseases (April 2009 to December 2011) were hand-searched. Results were supplemented using the reference lists of the articles identified and papers from the reviewers' collections. An additional PubMed search (for the words 'influenza' and 'school') was used to identify relevant papers published during October—December 2011 but not yet listed in MEDLINE or EMBASE Inclusion criteria: *Described one or more influenza outbreaks during which schools were initially open and subsequently closed, with or without other interventions *If papers presented several measures of influenza activity, the most specific data were extracted (eg, data on laboratory-confirmed influenza were extracted in preference to all-cause school absenteeism) *Studies using modelling techniques to assess how school closure affected transmission based on real epidemic curves were eligible Exclusion criteria: *Predictive modelling studies exploring how school closure might affect a hypothetical outbreak *Studies written in languages other than English *Studies of outbreaks which started during school closure Sample: 22 studies including 19 epidemic curves. Europe: n=6; Asia: n=7; Australasia: n=2; Americas: n=7	Disease/infectious agent: Influenza Case definition: *NA Sampling (specimen, frequency, duration): *NA Lab Method: NA

Outcome definition, results	Comments, limitations
Exclusion period: School closure, any duration Reduction in influenza transmission: Peak and cumulative attack rates (95% CI's); normalised peak (peak AR/median AR) for datasets with a median AR>0 (to adjust approximately for differences in case definitions and stratified by timing of closure); Association between school closure and outcome: usually comparison of cases before closure and after closure. Results: The results suggest that school closure can reduce transmission of seasonal influenza among school-children. However, many datasets show no clear effect of school closure, possibly because schools in these instances shut late in the outbreak. Incidence sometimes rebounded when schools reopened and this reversibility of effects may be seen as evidence for school closure causing reduction in incidence. Complicating factors were 1) the use of multiple interventions and 2) variation in case definition (from absenteeism to laboratory confirmation, being relatively non-specific and severe, respectively).	Comments: *Search terms are reported in supplementary material *The optimal school closure strategy does not become clear Limitations: NR

AR: attack rates CI: confidence interval

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Sato Journal: Pediatr Infect Dis J Pub Year: 2005 Aim: To estimate the efficacy of oseltamivir and zanamivir on the duration of the clinical illness and on virus shedding in children with influenza A and B.	Country: Japan Study design: RCT Study period & duration: December 2002 to April 2003	Setting: Hospital Source population: 63 children who were diagnosed with influenza A or B and were admitted to Fukushima South Aizu Hospital Inclusion criteria: *Admitted within 48 hours after onset because of dehydration or respiratory complications Exclusion criteria: *Patients with obvious bacterial infection or underlying illness Sample: Influenza A *n=37 positive for influenza A; n=10 randomized to the no antivirals group (n=12 randomized to oral oseltamivir group and n=11 randomized to zanamivir inhalation group) *Age range in no antivirals group: 1-6 yrs; mean (± SD): 4.7 (± 1.9) yrs *Gender: NR Influenza B *n=26 positive for influenza B; n=9 randomized to the no antivirals group (n=8 randomized to oseltamivir group and n=8 randomized to zanamivir group) *Age range in no antivirals group: 5 months-7 yrs; mean (± SD): 3.8 (± 3.1) yrs *Gender: NR	Disease/infectious agent: Influenza A H3N2, Influenza B Case definition: *Hospitalized for dehydration or respiratory complications *Positive for influenza A or B based on a rapid diagnosis kit Sampling (specimen, frequency, duration): *Nasal aspiration samples *Collected every morning *Until 2 negative antigen results were obtained from 2 consecutive samples Lab Method: *Detection of influenza virus antigen with a rapid diagnosis kit *Detection of influenza virus by cell culture

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: *Number of days from onset to last positive influenza virus A antigen sample before 2 consecutive negative samples *Number of days from onset with positive virus isolation results Results: Mean (± SD): *Influenza A antigen: 7.3 (±2.5) days after onset *Positive virus A isolation: 6.8 (± 1.7) days after onset *Influenza B antigen: 4.6 (± 1.0) days after onset *Positive virus B isolation: 6.2 (± 1.3) days after onset	Comments: *Duration of shedding for Influenza A (days after onset) in treated group: -virus antigen, with oral oseltamivir : 6.2 (± 1.6), zanamivir inhalation: 5.8 (± 2.2) -positive virus isolation, with oral oseltamivir : 6.3 (± 1.5), zanamivir (no significant difference among 3 treatment groups)inhalation: 5.4 (± 1.9) (no significant difference among 3 treatment groups) *Duration of shedding for Influenza B (days after onset) -virus antigen, with oral oseltamivir : 4.1 (± 1.5), zanamivir inhalation: 3.9 (± 1.3) (no significant difference among 3 treatment groups) -positive virus isolation, with oral oseltamivir : 5.6 (± 1.55), zanamivir inhalation: 4.3 (± 1.3) (significant difference between no antiviral treatment and zanamivir inhalation; no significant difference between no antiviral treatment and oseltamivir or oseltamivir and zanamivir) Limitations: *Pallas assumed the duration of shedding is expressed as mean (± SD) but the authors did not mention this explicitly

NR: not reported; RCT: randomized controlled trial; SD: standard deviation; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Sugisaki Journal: PLoS One Pub Year: 2013 Aim: To assess the relationship between school actions and the control of influenza outbreaks in elementary schools during 4 consecutive influenza seasons using absenteeism data for school children infected with influenza and the class closure condition.	Country: Japan Study design: Retrospective surveillance study Study period & duration: Schools yrs 2004-2005 to 2007-2008	Setting: Schools Source population: Joetsu City Board of Education with data on total absenteeism due to influenza or influenza-like illness in each class and type of school action from n=54 elementary schools with n=537-599 classes from the first to sixth grades Exclusion criteria: *Schools with less than 2 classes per grade Sample: *1,061 classes (median number of children, 29; range, 17–42) from 72 schools were analyzed during 4 consecutive yrs. n=624 cases from a total of 61 schools experienced influenza outbreaks. A total of 62 class closures were carried out *Children aged 6-11 yrs *Gender: NR	Disease/infectious agent: Influenza Case definition: *Children with oral reports of fever, coughing, sore throat, coryza, or direct reports from household; and in almost all cases *Diagnosed with rapid antigen detection test Sampling (specimen, frequency, duration): *NR Lab method: Rapid antigen detection test

Outcome definition, results	Comments, limitations
Types of class closures: *Standard class closure: 2 day-class closure, carried out the day following student absentee rates due to influenza or influenza-like illness reaching 10% *Non-standard class closure: different approaches (e.g. 1-day class closure carried out after 10% absentee rate ("one day class-closure"); or class closures carried out ≥2 days after a 10% student absentee rate ("delayed") *Non-closure: no class closure, even at student absentee rates of >10%. *Combined: non-standard + non-closure *Outcome: 1. Outbreak duration; 2. Interruption of an outbreak within 1 week *"Standard class closure" led to shorter outbreak duration compared with "non-standard class closures" (adjusted difference in days: -4.09 [95%CI -7.08 to -1.10], p=0.008) *"Standard class closure" led to better interruption within 1 week compared to "combined" (adjusted OR 3.18 [95%CI 1.12 to 9.07], p=0.03). *Both ORs adjusted for: season, grade, absentee rate at star day of outbreak, and day of the week for starting an outbreak. *Conclusion: during an influenza outbreak in a class, a 2-day class closure carried out the day after the student absentee rate reaches ≥10% is effective for mitigating outbreaks in elementary schools. *"Non-standard closures" were shown to be relatively ineffective at mitigating an influenza outbreak with a class, but subgroup analyses revealed that "one-day class closure" effectively interrupted outbreaks within 1 week and resulted in outbreaks of shorter duration than those controlled by "standard class closures".	Comments: *Entire school closures were not reported *Linear regression to calculate the difference in the number of outbreak days between standard and non-standard; logistic regression to calculate ORs for the effect of standard class closures *Information on the characteristics of influenza outbreaks and class closures available in Table 2 in the article. Limitations: *Data were collected by individual schools, it is possible that this data was incomplete regarding influenza cases and rates of absenteeism. *Only larger schools with >2 classes in each grade analyses, it is possible that trends in small schools would show different outcomes *Effects of class-closures on inter-class transmission not considered in the statistical model (this is a limitation of the statistical analyses and should be considered when interpreting the results) *Vaccination rate of students in Joetsu City not know *All children with influenza treated with antiviral drugs

NR: not reported; OR(s): odds ratio(s); yrs: years

Scarlet Fever (n=2)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Hoek Journal: Eurosurveillance Pub Year: 2006 Aim: To describe a scarlet fever outbreak in two nurseries in southwest England.	Country: United Kingdom Study design: Outbreak investigation Study period & duration: January and February 2006	Setting: Nurseries Source population: Children attending one of two nurseries Sample: In the nursery where an intervention took place: *n=57 children attended the nursery and n=11 staff; n=15 ill children and n=1 ill staff members; of which n=4 confirmed cases, n=6 probable cases, n=6 possible cases *Age: nursery children + adult *Gender: NR	Disease/infectious agent: Beta-haemolytic streptococci group A Case definition: *Disease characterized by sore throat, skin rash which does not normally involve face, flushing of cheeks, pallor around the mouth, and high fever; patients with severe infection of have nausea and vomiting *Definitions of confirmed, probable and possible cases NR, though likely previously defined clinical and microbiological case definitions Sampling (specimen, frequency, duration): *Throat swabs *NA Lab Method: NR

Outcome definition, results	Comments, limitations
Exclusion period: Excluded for 5 days after the start of treatment with penicillin. Closure (one on advice, once for holidays) On January 23, 2006, local health authority informed of an outbreak of scarlet fever in a nursery. All symptomatic children were excluded from the nursery for 5 days after the start of treatment with penicillin. The nursery was closed between 6-7 February on advice of local education authorities and for holidays between 13-18 February. Results: Symptoms of the last reported case began on February 8	Comments: NR Limitations: *Cases received penicillin

NA: not applicable; NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Lamden Journal: Arch Dis Child Pub Year: 2010 Aim: To describe an outbreak of scarlet fever in a primary school.	Country: England Study design: Outbreak investigation Study period & duration: March 2009 (4 weeks)	Setting: Primary school Source population: Pupils from a primary school in Lancashire For the epidemiological study potential cases were identified from the school absence register Sample: *n=57 cases (n=9 confirmed cases, n=12 probable and n=36 possible cases) *Age range: 4-11 yrs; mean: 8 yrs *M/F-ratio: 28/29	Disease/infectious agent: Group A *Streptococcus S. pyogenes* group B type emm3 Case definition: *Cases were classified on the basis of microbiology and symptoms reported by parents to the school. Cases were defined as confirmed (clinical symptoms plus throat isolate of GABHS), probable (rash and none or negative throat swab) or possible (sore throat alone). *The clinical presentation included pharyngitis, flushed facial appearance with inflammation and soreness around the mouth, and an extensive florid rash. Not all children had a rash. Sampling (specimen, frequency, duration): *Throat swabs *NA Lab Method: NR

Outcome definition, results	Comments, limitations
Exclusion period: Exclusion of cases from school was rigorously enforced and although the minimum exclusion was 24 hours, in practice it was usually 48 hours Exclude symptomatic children from school until they had received at least 24 hours of penicillin treatment. Other control measures were: closure of water fountains, disinfection of children's water bottles, extra washing of toys, extensive promotion of hand-washing. Results: Ineffective, control measures had little impact on disease transmission. 57 out of 126 pupils developed scarlet fever -days absent from school: 1-10 (median, 3)	Comments: *GABHS type emm3 was isolated from 9/13 throat swabs obtained *Index case absent from school on March 3rd, report to CDC on March 10th, control measures in place with just 6 children unwell *37/57 received antibiotics Reasons for continuing transmission: -only 65% of cases received antibiotics. The advice was to prescribe antibiotics for 10 days; however 10-day course only prescribed in 54% of those receiving antibiotics. Additionally, there was possibly also lack of therapy compliance -carriers of GABHS in the school and household probably contributed to continuance, although it is also possible that cases in the wider community helped to sustain the outbreak Limitations: *Multiple interventions

CDC: center for disease prevention and control; GABHS: group A β-haemolytic *streptococcus*; M/F-ratio: male-to-female ratio; NR: not reported; yrs: years

Streptococcal pharyngitis (n=1)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Snellman Journal: Pediatrics Pub Year: 1993 Aim: To determine if it is appropriate to recommend that patients with group A β-hemolytic streptococcal pharyngitis, who are clinically well by the morning after starting antibiotic treatment, can return to school or day care or if they should wait until they have completed 24 hrs of antibiotics as recommended by the American Academy of Pediatrics Committee on Infectious Diseases.	Country: United States Study design: RCT Study period & duration: October 1988 to April 1989 and September 1989 to May 1990	Setting: Medical center Source population: Children aged 4-17 years who came to the pediatric department at the White Bear Lake Medical Center of Group Health, Inc with signs and symptoms compatible with streptococcal pharyngitis Inclusion criteria: *Having no concurrent bacterial infection, *No allergy to the antibiotics used in the study *Living within a 15-minute drive of the clinic *Being available for three repeat home visits during the 24 hours after enrollment in the study *Not having received oral antibiotics within the previous week or benzathine penicillin within the previous month *Positive for the rapid group A streptococcal antigen detection test Sample: *n=47; n=17 randomized to the oral penicillin group, n=15 to the intramuscular benzathine penicillin G group and n=15 to the oral erythromycin estolate group *Age range: 4-16 yrs; mean: 8.9 yrs *M/F-ratio: 33/14	Disease/infectious agent: Group A Streptococci Case definition: *Signs and symptoms compatible with streptococcal pharyngitis *Patients who were positive for streptococcal antigen Sampling (specimen, frequency, duration): *Throat swabs *3x during the subsequent 24 hours after treatment Lab Method: Throat cultures and rapid group A streptococcal antigen detection test culture plates that failed to yield any colonies GABH-colonies after 72 hours were considered negative

Outcome definition, results	Comments, limitations
Exclusion period: <24 hours after initiating antibiotic therapy Readiness of children to return to school or day care the morning after initiating antibiotics; as measured by throat culture positivity Results: *17/47 cultures were still positive the next morning between 7 and 8 am: OE: n=8/15, BPG: n=4/15; OP: n=5/17 *Mean time to negative culture for the 39/47 cases who became culture negative by the fourth culture (8 did not): 17.6 ± 5.73 hours -in the OE group (n=7, excl n=6 prolonged positives): 14.7 ± 5.80 hours -in the BPG group (n=14, excl n=1 prolonged positive): 18.8 ± 5.75 hours -in the OP group (n=16, excl n=1 prolonged positive): 18.1 ± 5.66 hours * 37% of children still had a positive throat culture the morning after initiating antibiotics *"even though children may be asymptomatic by the morning after initiating antibiotic therapy, children with positive throat cultures for group A streptococcal pharyngitis should complete a full 24 hours of antibiotic therapy"	Comments: *Among 81/130 children: the time of acquisition was well defined *No patient was febrile at the time of the nurse's visit and throat culture at 7-8 am next morning. *Authors state their data are the first they are aware of that quantitatively document the recommendation that children complete a full 24 hours of antibiotics before the return to school or day care (and not 'the next morning') *Negativity of throat cultures does not represent eradication of streptococci from the upper respiratory tract, but it reflects decreased "contagiousness" *Time of conversion to negative culture differed by type of antibiotic (possibly due to resistance of the strain) *Oral penicillin group: 250 mg, 3/day, 10 days; intramuscular benzathine penicillin G group: 0.6 million units if body weight <60 pounds, 1.2 million units if body weight >60 pounds; and oral erythromycin estolate group: 250 mg, 3/day, 10 days. Limitations: NR

BPG: benzathine penicillin G; GABH: group A β-haemolytic streptococci; M/F-ratio: male-to-female ratio; OE: oral erythromycin estolate; OP: oral penicillin; RCT: randomized controlled trial; yrs: years

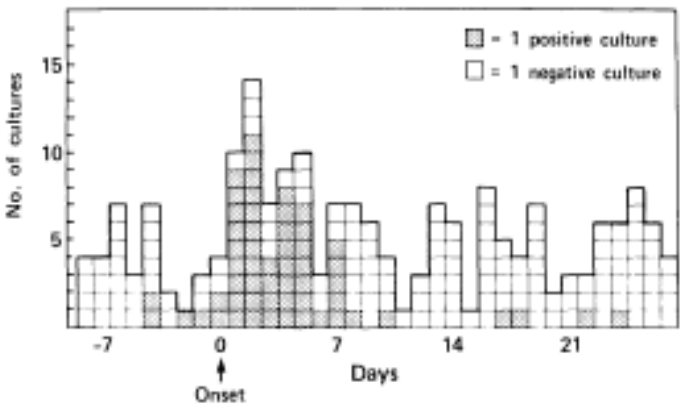
Streptococcal impetigo (n=0)

Respiratory Syncytial Virus (n=8)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Frank Journal: J Infect Dis Pub Year: 1981 Aim: To describe naturally acquired infections over a 4-yr period in children with mild to moderately severe illness.	Country: United States Study design: Prospective follow-up study Study period & duration: 1975 to 1979	Setting: Households Source population: Participants in the Houston Family Study (racially and socioeconomically mixed group residing in the Houston area) Inclusion criteria: *Families enrolled with the birth of a new infant *RSV infection Sample: n=70 families, including 80-100 children were followed at any one time. n=48 episodes (44 individual cases) *Children <4 yrs *Gender: NR	Disease/infectious agent: RSV Case definition: *Illness (not further specified); and *Virus-proven Sampling (specimen, frequency, duration): *Nasal washes or throat swabs *Weekly or biweekly, whether or not the child was ill; and additional specimens sometimes obtained due to presence of illness (in child or family member). For Influenza B in 1980 only: 2-3 times per week Lab method: CPE, hemadsorption, indirect immunofluorescence

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Shedding during time between sampling (at set intervals) and onset of disease. Only isolates obtained <9 days before the onset were considered to be related to the subsequent illness and up to 40 days after onset of illness. Results: *Table. Proportion of positive samples by time from onset of symptoms	*Figure. Positive and negative cultures in relation to the onset of RSV-associated illness, 1975-1979	Comments: NR Limitations: NR

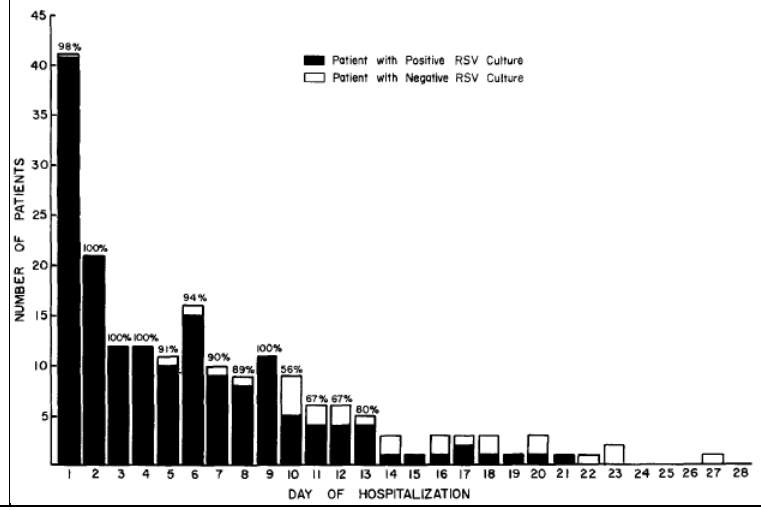
Time from onset of symptoms	Positive samples/ total samples	% positive
Days -5 to -8	0/18	0%
Days -1 to -4	4/13	31%
Days 0 to 3	26/35	74%
Days 4 to 7	21/29	72%
Days 8 to 11	2/18	11%
Days 12 to 15	0/17	0%
Days 16 to 19	2/24	8%
Days 20 to 23	1/14	7%



Days 24 to 27	1/24	4%		

CPE: cytopathic effects; NR: not reported; RSV: respiratory syncytial virus; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Hall Journal: J Ped Pub Year: 1976 Aim: To delineate the quantitative shedding patterns and duration of shedding of RSV among children with acute lower respiratory tract disease.	Country: United States Study design: Case series Study period & duration: 2-months in the winter of 1975	Setting: Hospital Source population: Children admitted to Strong Memorial Hospital, New York Inclusion criteria: *<3 years of age *Admitted with acute respiratory tract disease Sample: *n=59 patients; of which n=23 were followed until they ceased shedding RSV *Median age: 4 months; range: 10 days to 2 yrs *M/F-ratio: 13/10	Disease/infectious agent: RSV Case definition: *Acute respiratory tract disease *Positive for RSV Sampling (specimen, frequency, duration): *Nasal wash specimens *Every 1-3 days Lab Method: Cell cultures

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: From hospitalisation until end of shedding or discharge if follow-up if at home was not possible Results: *Range: 1-21 days from hospitalisation *Mean: 6.7 days from hospitalisation *Girls tend to shed longer than boys, mean 9.0 days compared to 5.08 days (p>0.05 and <0.10) *No significant correlation between shedding and age *Infants with lower respiratory tract disease shed for a significantly longer period (mean 8.4 days) than those with upper respiratory illness (mean 1.4 days) (p<0.01). *Infants hospitalized for longer periods tended to have more prolonged shedding of RSV, though not statistically significant.	*Figure. Frequency of RSV shedding according to hospital day in children with lower respiratory tract disease  	Comments: *Daily samples were obtained from 10/23 patients Limitations: *Duration of shedding from hospitalisation, not disease onset *The number of patients available for testing progressively declined because of discharge. However, infants who appeared to be shedding virus at the time of discharge were, when possible, followed at home

M/F-ratio: male-to-female ratio; NA; Not reported; RSV: Respiratory syncytial virus; yrs: years

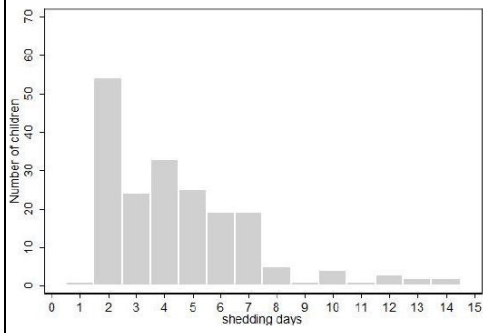
Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Hall Journal: N Eng J Med Pub Year: 1976 Aim: To determine symptoms and collect specimens for viral isolation from all members of a group of families during a community outbreak of infection with respiratory syncytial virus.	Country: NR, but probably United States Study design: Prospective follow-up Study period & duration: December 30, 1974 to March 1, 1975	Setting: Households Source population: Families were selected two months before the study by their pediatricians at the Genesee Health service Inclusion criteria: *Families with two or more children, one of whom less than a year of age Sample: *n=178 family members participated, in n=39 members the virus was isolated *Age of infected members <1 yr: n=10 1 -<2 yrs: n=2 2 - <5 yrs: n=9 5 - <17 yrs: n=9 17 - 45 yrs: n=9 *M/F-ratio of all : 59/64	Disease/infectious agent: Respiratory syncytial virus Case definition: *Having acute respiratory symptoms (nasal congestion; cough; hoarseness; sore throat); and *Virus isolated Sampling (specimen, frequency, duration): *Nose and throat specimens *Every three to four days *For a maximum of 2 months (during January and February) Lab Method: Cultures

Outcome definition, results	Comments, limitations
Outcome definition: Duration of shedding: NR, but seems the time interval between first positive culture and last positive culture Results: Period of shedding in children aged <2 yrs with more than one culture (n=6) Range: 6 - 36 days All children <2 yrs (n=12) Mean: 9 days Children <16 yrs (n=30) Mean: 3.9 days	Comments: *Some family members may already have been infected before the initiation of the study *Children <2 yrs shed for significantly longer periods than children aged <16 yrs Limitations: *All but to, who were school-aged children, of the positive members had acute respiratory symptoms *Since the time of between cultures was three to four days, the actual mean would be greater than 3.4 and less than 7.4 days

M/F-ratio: male-to-female ratio; NA: not applicable; NR: not reported; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Hall Journal: Pediatrics Pub Year: 1978 Aim: To evaluate methods to control the spread of RSV on an infants' ward during a community outbreak of RSV infection.	Country: United States Study design: Case series Study period & duration: Winter 1976	Setting: Hospital Source population: Patients on the ward for children less than 2 yrs of age at the Strong Memorial Hospital, New York Inclusion criteria: *Nosocomial RSV infection *Hospitalized for >7 days Sample: *n=87 contact infants potentially at risk for nosocomial RSV infection, of whom n=42 were hospitalized for >7 days, of whom n=8 developed nosocomial RSV infection *Median age of contacts: 13 months *Among contacts 75% boys	Disease/infectious agent: RSV Case definition: *Nosocomial RSV infection: if RSV was first obtained from the nasal wash ≥1 week after admission, and if 2 prior nasal washes were negative for RSV *Infants examined every 3 to 4 days and respiratory tract signs and symptoms were recorded; chest roentgenograms were obtained on all patients with respiratory tract disease. All of the nosocomially infected infants had an acute respiratory illness in association with their RSV shedding Sampling (specimen, frequency, duration): *Nasal wash specimens *Every 3 to 4 days *NR for how long Lab method: Hemadsorption testing
Outcome definition, results			Comments, limitations
Outcome definition: Duration of shedding: Number of days the virus was shed, presumably after 1st positive sample. In a parallel study in adults, cessation of RSV shedding was defined as ≥5 negative isolation attempts. Results: Range: 3-11 days after 1st positive sample; mean: 4-6 days			Comments: NR Limitations: *Study in already hospitalized infants, might not be representative of healthy infants (2 admitted for acute infectious diseases, 3 for congenital anomalies, 2 for failure to thrive, 1 for malignancy)
NR: not reported; RSV: respiratory syncytial virus; yrs: years			

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Okiro Journal: BMC Infect Dis Pub Year: 2010 Aim: To report on the duration of virus shedding from RSV infected individuals within a family cohort in a rural Kenyan community, in relation to infection history, age and severity.	Country: Kenya Study design: Birth cohort and household cohort Study period & duration: Recruitment: January to June 2002 and December 2002 to May 2003 Monitoring: December 2003 to June 2004 and November 2004 to March 2005	Setting: Households in a rural Kenyan community Source population: n=151 families Birth cohort: recruitment at birth or within 2 weeks after birth. Intensive monitoring for ARI Family study: subsample of 70 households with one or more siblings of birth cohort children; presence of samples prompted sample collection All family members were monitored for ARI for a period including two RSV epidemic through weekly household visits during epidemics and monthly otherwise, self-referral to a research out-patient clinic and admission to a pediatric ward of the district hospital. Data on onset of symptoms defined by history was recorded at presentation to the research clinic. Nasal washings using a nasal wash bulb method were collected from infants and elder household sibling experiencing episodes of acute (rapid onset) respiratory illness, where mild (e.g. runny nose) or more severe. The presence or history of these symptoms in the preceding week was used as a prompt for sample collection. Children with these symptoms who tested positive for RSV were enrolled in the shedding study. Sample: *n=193 children with RSV infection (160 birth cohort infants and 33 siblings); for n=136 children attended the clinic and therefore the day of symptom onset was known (the others were seen at home) *Age: median 21 months; range: 2-164 months; 10.4% <1 yr, 70% <2 yrs *M/F-ratio: 46%/54%	Disease/infectious agent: RSV Case definition: *Acute (rapid onset) respiratory illness *Positive RSV test Sampling (specimen, frequency, duration): *Nasal washings *Following identification of RSV, a further nasal wash obtained as soon as possible, and thereafter scheduled for every 3 days up to day 14, thereafter an additional 7 and 14 days, and subsequently every 2 weeks up to 16 weeks. *During follow-up no further samples were taken after a single sample tested antigen negative by direct immunofluorescent antibody test Lab Method: Direct immunofluorescent antibody test on nasal washing using nasal bulb method

Outcome definition, results			Comments, limitations
Outcome definition: Duration of shedding: For data records from research clinic visits where relevant information was collected, the start date for viral shedding was considered to coincide with the start of the onset of symptoms defined by history taken at presentation to the research clinic with day 0 as the first day of symptoms. For others, the first day of sampling was day 0. The end of shedding was denoted by the first negative test sample. Results: *For 136/193 children who attended the clinic (=with known date of symptom onset):	*Table 1. Rates of recovery from infection (cessation of shedding virus) per day estimated using survival analysis using data from 192 RSV infected Kenyan children *Table 2. Cox regression model results to examine factors independently associated with cessation of shedding in 192 RSV infected Kenyan children	*Figure 1. Frequency of RSV shedding 	Comments: *A comparison of the two populations (clinic attendees, for whom date of symptom onset was known, and non-clinic attendees, for whom date of first sample was used) reveals that the ages of the children were similar, but all children seen at home had an URTI (except for one child who had a severe LRTI and was referred to hospital for admission) whereas 21% of children presenting to the clinic had a diagnosis of mild or severe LRTI *192 negative results, i.e. indicating cessation of shedding, were observed. One child died in hospital before completing the study and due to lack of further information is right censored *77 children had a known previous history of RSV infection

Feature		Number	Mean duration of shedding	Lower CI	Upper CI
History	never infected	115	4.9	4.1	5.8
	infected	77	4.1	3.3	5.1
sex	Male	88	4.4	3.6	5.4
	Female	104	4.7	3.9	5.7
Age group	0-11 months	21	4.4	2.9	6.7
	12-17 months	35	4.9	3.5	6.8
	18-23 months	65	4.9	3.9	6.3
	24+ months	71	4.1	3.3	5.2
Severity	URTI	165	4.4	3.8	5.1
	Mild LRTI	20	5.6	3.6	8.8
	Severe LRTI	7	5.2	2.5	10.8
Revised History[5]	never infected	96	5.1	4.2	6.2
	infected	96	4.0	3.3	4.9

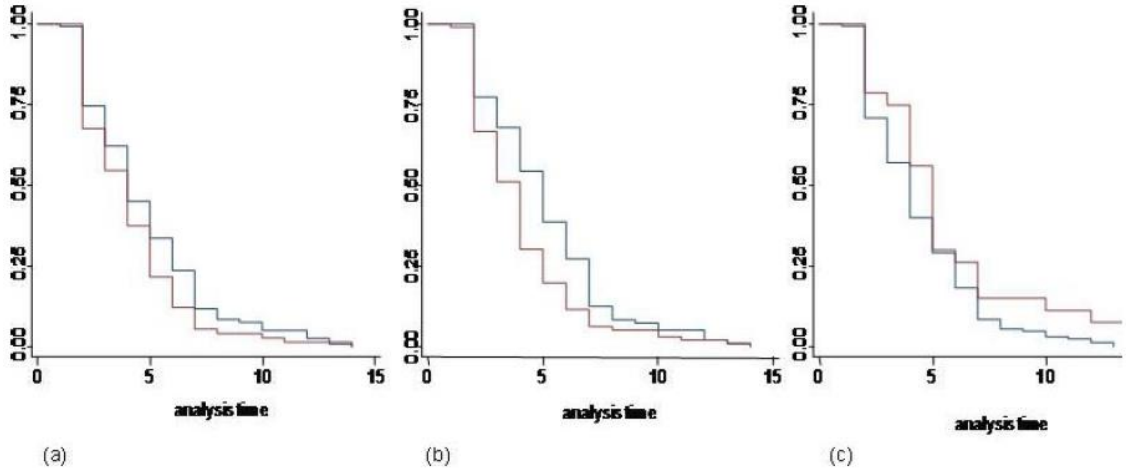
[5] Assumes children over 3 years (greater than 36 months old) have been previously infected.

Mean: 7.69 days (95%CI 6.41-8.98) from symptom onset For all children who did or did not attend the clinic (=with either known date of symptom onset or date of first sample) *Range: 1-14 days from symptom onset or first sample *Mean: 4.5 days (95% CI, 4.0-5.3) from symptom onset or first sample *Median: 4 days (IQR 2-6) from symptom onset or first sample				Limitations: *Data are subject to left censoring as exact start time of shedding was not observed. *For the non-clinic cases, shedding not measured from time of symptom onset *Duration of shedding may have been underestimated by taking the first negative test to indicate cessation of shedding *More sensitive detection techniques such as PCR might be warranted *Viral load was not quantified. Quantification of viral load might have epidemiological consequences for transmission potential

Feature*		RR&	p-value	Lower CI	Upper CI
Revised history$	infected	1.37	0.04	1.01	1.86
Sex	Female	0.86	0.33	0.64	1.16
Age group	12-17 months	1.01	0.98	0.57	1.76
	18-23 months	0.91	0.73	0.54	1.53
	24+ months	1.08	0.78	0.65	1.80
Severity	Mild LRTI	0.69	0.15	0.42	1.14
	Severe LRTI	0.82	0.62	0.38	1.80

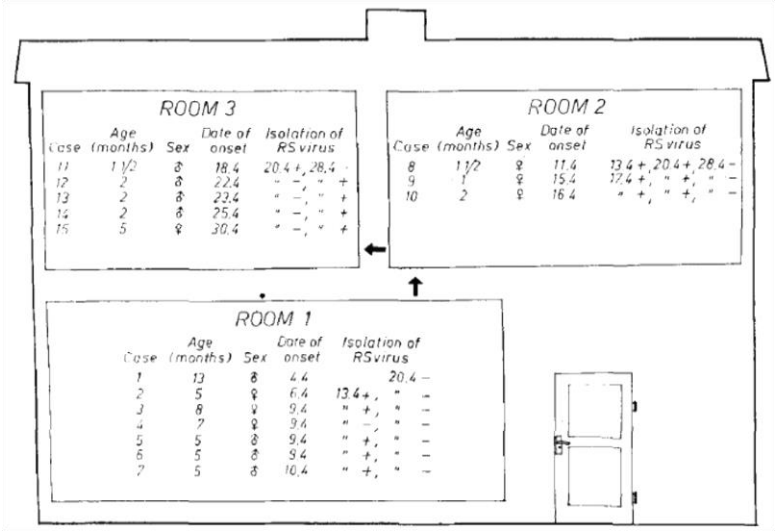
*baseline for each comparison is: no history of infection, male sex, 0-11 month age group and URTI severity.
&All estimates are adjusted for all other factors.
$Assumes children over 3 years (greater than 36 months old) have been previously infected.

*Figure 2. Kaplan-Meier survivor function plots for cessation of shedding of RSV in infected Kenyan children. Results are categorised by age class (blue: 0-23 months; maroon: 24+ months) in Graph a, by infection history (blue: never infected; maroon: infected-significantly different; log rank test $p < 0.05$) in Graph b, and by severity (blue: URTI; maroon: LRTI) in Graph c.



ARI: acute respiratory illness; CI: confidence interval; IQR: interquartile range; LRTI: lower respiratory tract infection; M/F-ratio: male-to-female ratio; PCR: polymerase chain reaction; RSV: respiratory syncytial virus; URTI: upper respiratory tract infection; yrs: years

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Sterner Journal: Acta Paediatr Scand Pub Year: 1966 Aim: To present virological, epidemiological and clinical findings during an outbreak of RSV infections in a home for infants in Stockholm.	Country: Sweden Study design: Outbreak investigation Study period & duration: Between April and May 1964	Setting: Home for infants Source population: All infants at a home for infants, in Stockholm Inclusion criteria: *Ill with acute respiratory disease *Laboratory-confirmed RSV Sample: *n=15 infants; RSV was isolated in n=13 *Age range: 1-13 months *M/F-ratio: 8/7	Disease/infectious agent: RSV Case definition: *Clinical symptoms with acute respiratory diseases (signs of acute respiratory illness, with rhinitis, pharyngitis, and a cough which was slightly hoarse) *Confirmed with culture of HeLa cells, serum testing of CF antibody and bacterial study to rule out pneumococci, streptococci, *Staphylococcus aureus* and *Haemophilus influenza* Sampling (specimen, frequency, duration): *Pharynx and nasopharynx swabs *2 or 3 times, 1 week apart Lab Method: Culture of HeLa cells, isolate typing by complement fixation or neutralisation against test sera from guinea pigs

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Time span during which shedding took place Results: RSV was isolated during a period from 2 days before to 9 days after onset of illness	*Figure. Age, sex, date of onset of illness and virus findings in 15 children with RS  virus infection	Comments: NR Limitations: *The incubation period appeared to be from 3-5 days, but unclear how this was calculated

CF: complement fixation; M/F-ratio: male-to-female ratio; NR: not reported; RSV: respiratory syncytial virus

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr><td>Author: Sung

Journal: Arch Dis Child

Pub Year: 1993

Aim: To carry out a double blind, controlled study on the efficacy of INF-α in reducing the morbidity of acute bronchiolitis and the RSV shedding time.</td><td>Country: Hong Kong

Study design: RCT

Study period & duration: April 1991 to October 1992</td><td>Setting: Hospital

Source population: Infants admitted to the pediatric wards at the Prince of Wales Hospital, Hong Kong

Inclusion criteria :
*First admission with acute bronchiolitis and a positive immunofluorescence test of the nasopharyngeal aspirate for RSV
*Ill enough to require at least 3 days of hospitalisation

Exclusion criteria:
*Congenital heart disease or bronchopulmonary dysplasia

Sample:
*n=52 infants, of whom n=36 randomized to placebo group
*Mean (± SD) age in placebo group: 6.29 months (± 3.75)
*M/F-ratio in placebo group: 26/10</td><td>Disease/infectious agent: RSV

Case definition:
*Acute bronchiolitis: (i) age ≤24 months, (ii) signs of preceding or coexisting viral respiratory illness, (iii) first attack of expiratory wheezing, and (iv) respiratory distress: dyspnoea or tachypnoea (respiratory rate >40/min); and
*Positive for RSV

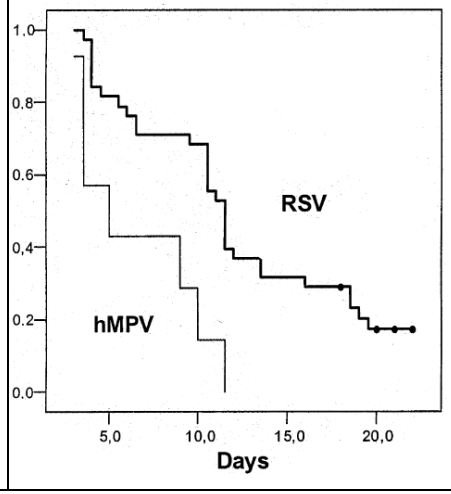
Sampling (specimen, frequency, duration):
*Nasopharyngeal aspirates
*Daily during hospitalisation
*Mean duration of hospitalisation: 6.25 days; range 4-12 days

Lab method: Direct immunofluorescent antigen tests for RSV</td></tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td colspan="3">Outcome definition:
Duration of shedding: Kaplan-Meier curve for duration of virus shedding time after onset of illness

Results:
*Table. Probability of virus shedding by day after onset of illness
<table><tr><th>Day after onset of illness</th><th>Probability of RSV shedding (%)*</th></tr><tr><td>Days 0-2</td><td>100%</td></tr><tr><td>Day 3</td><td>98%</td></tr><tr><td>Day 4</td><td>90%</td></tr><tr><td>Day 5</td><td>80%</td></tr><tr><td>Day 6</td><td>63%</td></tr><tr><td>Day 7</td><td>53%</td></tr><tr><td>Day 8</td><td>45%</td></tr><tr><td>Day 9</td><td>33%</td></tr><tr><td>Day 10</td><td>18%</td></tr><tr><td>Day 11</td><td>13%</td></tr><tr><td>Day 12</td><td>5%</td></tr><tr><td>Days 13-16</td><td>2%</td></tr></table>*% read from graph by Pallas</td><td>Comments:
*No difference in viral shedding time between the INF-α-2a and placebo groups

Limitations:
NR</td></tr>
<tr><td colspan="4">INF-α-2a: interferon alfa-2a; M/F-ratio: male-to-female ratio; min: minutes; NR: not reported; RCT: randomized controlled trial; RSV: respiratory syncytial virus; SD: standard deviation; yr(s): year(s)</td></tr>
</table>

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Von Linstow Journal: Eur J Med Res Pub Year: 2006 Aim: To examine the modes of virus shedding and the shedding duration of RSV and hMPV in young children.	Country: Denmark Study design: Case series Study period & duration: November 1, 2003 to April 30, 2004	Setting: Hospital Source population: Children admitted to the department of pediatrics of Hvidovre Hospital, Copenhagen Inclusion criteria: *Admitted with acute respiratory tract infection *Either RSV or hMPV detected. (Study also describes results for hMPV infected children, not shown here) Exclusion criteria: *Children whose parents did not speak or understand Danish *Lived outside of admission area of hospital Sample: *n=38 RSV infected children, of which one1 co-infected RSV+hMPV; n=175 nasopharyngeal aspirates (NPA) *Median age: 3.7 months; range: 0.5-32.9 months *M/F-ratio: 27/11	Disease/infectious agent: RSV Case definition: *Confirmed RSV infection. Sampling (specimen, frequency, duration): *NPA *Collected at inclusion again after 1, 2, and 3 weeks (mean days (range): 8.3 (4-13); 15.4 (12-20); 21.9 (18-27) after admission to hospital) Lab Method: RT-PCR or ELISA

Outcome definition, results		Comments, limitations
Outcome definition: Duration of shedding: Midpoint between the time of the last positive test and the time of the first negative test afterwards; by time from admission to hospital Results: *Median: 11.5 days (IQR 6.5-18.5) after admission to hospital	*Figure. Kaplan Meyer analysis of shedding duration of RSV and hMPV RNA in nasopharyngeal aspirate specimens.  Dots: RSV-censored samples	Comments: *Duration of symptoms prior to hospitalisation: median 4 days; range 0-17 days *Also collected sweat and blood samples at inclusion; and urine and stool samples at all sampling moments RSV RNA was found in 5 stool samples from 5 different children (all positive samples within 2 days of diagnostic NPA); in 3 sweat samples (all within 3 days of the first positive NPA); no viral RNA in any urine or blood samples. *4/5 children with RSV in stools had diarrhea *Excretion of viral RNA in sweat was limited to children of <5 weeks or children with a chronic lung disease, indicating that an immature or defective immune response makes it easier for virus to spread from the upper respiratory tract Limitations: *Duration of shedding not from symptom onset but from admission to hospital *9 children presented a negative sample in between 2 positive samples, it was assumed that they shed RSV until the last positive sample (new infection unlikely)

ELISA: enzyme-linked immunoassay; hMPV: Human Metapneumovirus; IQR: interquartile range; M/F-ratio: male-to-female ratio; NPA: nasopharyngeal aspirate; RNA: ribonucleic acid; RSV: respiratory syncytial virus; RT-PCR: reverse-transcription polymerase chain reaction

Infectious mononucleosis (n=1)

<table>
<tr><th>Author, journal, year, aim</th><th>Country, study design, study period and duration</th><th>Setting, source population , in/exclusion criteria, sample size, age, gender</th><th>Disease/Infectious agent, case definition, sampling, laboratory-methods</th></tr>
<tr><td>Author: Sumaya

Journal: Pediatrics

Pub Year: 1985

Aim: To address the need to establish the rate of positive heterophil antibody responses, oropharyngeal isolation of EBV, and the evolving pattern of EBV-specific antibody responses among children with documented EBV-infectious mononucleosis.</td><td>Country: United States

Study design: Case series

Study period & duration: >29 weeks; period NR</td><td>Setting: Hospital

Source population: Children seen at department of pediatrics and pathology, University of Texas Health Science Center, San Antonio, United States

Inclusion criteria:
*Clinical and hematologic findings compatible with infectious mononucleosis
*Disease etiologically associated with a primary EBV infection

Sample:
*n=113 patients
*Age range: 6 months to 16 yrs (6 months to 3 yrs: n=47; 4-16 yrs: n=66)
*Gender: NR</td><td>Disease/infectious agent: EBV

Case definition:
*Clinical and hematologic findings compatible with infectious mononucleosis; and
*Disease etiologically associated with a primary EBV infection

Sampling (specimen, frequency, duration):
*Swabbing of oropharynx (young children), gargle (older children)
*At intervals during the different phases of their illness

Lab method: Transformed cell culture</td></tr>
<tr><th colspan="3">Outcome definition, results</th><th>Comments, limitations</th></tr>
<tr><td colspan="3">Outcome definition:
Duration of shedding: Prevalence of EBV in oropharyngeal secretions during different phases of the disease (acute 0-3 weeks, convalescent 4-8 weeks, late phase 9-28 weeks, very late phase ≥29 weeks)

Results:
%Table. Prevalence of EBV in oropharyngeal secretions by phase of the disease

<table>
<tr><td></td><td colspan="4">Disease Phase</td></tr>
<tr><td>Age</td><td>Early</td><td>Convalescent</td><td>Late</td><td>Very late</td></tr>
<tr><td><4yrs</td><td>33/43 (76.7%)</td><td>9/15 (60.0%)</td><td>10/18 (55.6%)</td><td>2/5 (40.0%)</td></tr>
<tr><td>4-16 yrs</td><td>42/58 (72.4%)</td><td>12/23 (52.2%)</td><td>9/20 (45.0%)</td><td>11/16 (68.8%)</td></tr>
<tr><td>Total</td><td>75/101 (74.3%)</td><td>21/38 (55.3%)</td><td>19/38 (50.0%)</td><td>13/21 (61.9%)</td></tr>
</table>
</td><td>Comments:
*Unclear exactly when the children were sampled and if some were sampled more than once during one disease phase

Limitations:
NR</td></tr>
<tr><td colspan="4">EBV: Epstein-Barr Virus; NR: not reported; yrs: years</td></tr>
</table>

Other transmissible diseases common among children (n=2)

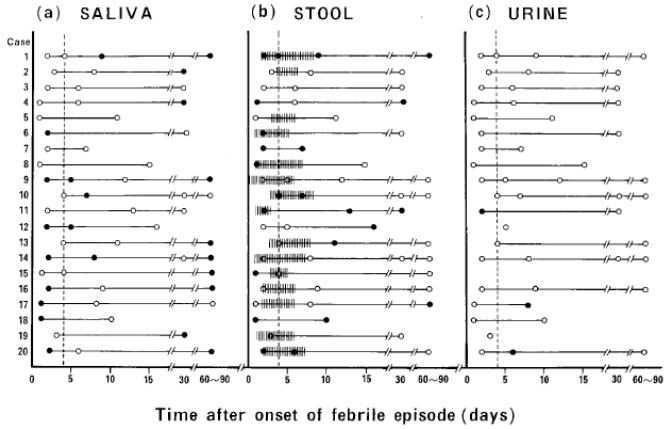
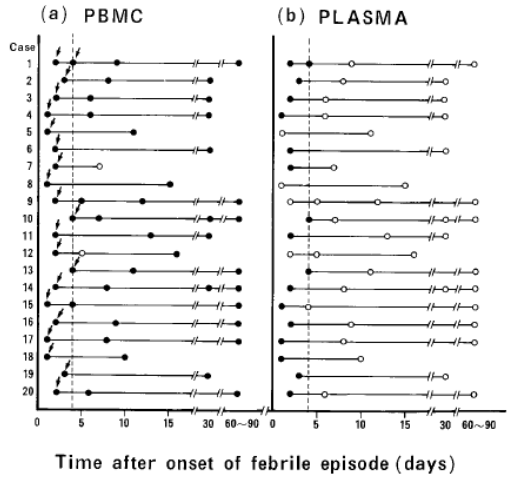
Roseola infantum (exanthem subitum) (n=2)

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Barenberg Journal: Am J Dis Child Pub Year: 1939 Aim: To perform a systematic clinical and blood study of exanthema subitum at a child-caring institution.	Country: United States Study design: Outbreak investigation Study period & duration: 30 September to 23 December, 1938	Setting: Home for Hebrew infants Source population: Children with roseola infantum at the home for Hebrew infants Inclusion criteria: *Patients with roseola infantum in the 1938 epidemic in three different wards Sample: *Incubation period calculated based on n=18 cases *Age range: 12-22 months *NR exactly for the 18 cases, about 50% male for the larger group	Disease/infectious agent: Exanthema subitum Case definition: *Based on medical records at the institution Sampling (sample, frequency, duration): *NA Lab Method: NA (White blood cell examination done; but infectious agent unknown at the time)

Outcome definition, results	Comments, limitations
Outcome definition: Serial interval: Likely from onset of signs in primary case to onset of signs in secondary case (fever, follicular tonsillitis, convulsion, diarrhea and vomiting) Results: Serial interval *Range: 5-15 days *Mean: 10 days	Comments: *Laboratory testing was done in 21 cases, some of these were from other wards than the wards on which the incubation time was calculated Limitations: *Likely to be serial interval rather than incubation period

NA: not applicable; NR: not reported

Author, journal, year, aim	Country, study design, study period and duration	Setting, source population , in/exclusion criteria, sample size, age, gender	Disease/Infectious agent, case definition, sampling, laboratory-methods
Author: Suga Journal: Pediatrics Pub Year: 1998 Aim: To elucidate the persistence of human herpesvirus-6 in the blood and excretion of the virus into several body fluids of patients with exanthema subitum, and to examine serologic and virologic findings of the parents caring for the patients in the family setting.	Country: Japan Study design: Case series Study period & duration: August 1993 to October 1994	Setting: Hospital Source population: Infants who were admitted to Fujita Health University Hospital and Showa Hospital Inclusion criteria: *Infants with primary HHV-6 infection and a typical clinical course of exanthem subitum (ES) Sample: *n=20 cases *Age range: 1-11 months; mean: 7.7 months *M/F-ratio: 11/9	Disease/infectious agent: HHV-6 Case definition: *The case definition of ES was febrile exanthema with HHV-6 viremia, and seroconversion to HHV-6 or a fourfold or greater increase in the antibody titers to HHV-6 Sampling (sample, frequency, duration): *Heparinized peripheral blood, saliva, stool, and urine *Collected within 5 days of visit and serially thereafter for 60 to 90 days Lab Method: Virus isolation by cocultivating peripheral blood MNCs with cord blood MNCs. Antibody titer to HHV-6 was measured by a neutralisation test. HHV-6 DNA was extracted from samples and amplified by nested double PCR. Specimens: Peripheral blood, plasma, saliva, stool and urine

Outcome definition, results			Comments, limitations
Outcome definition: Duration of shedding: Duration that HHV-6 DNA was detected in blood MNCs, plasma, saliva, stool and urine from onset of febrile episodes Results: *The viral DNA was detected persistently or intermittently in saliva and stool during and after the disease (60-90 days) but rarely in urine *The frequency of detection of HHV-6 DNA in saliva and stool samples obtained during the first 5 days of the disease was not significantly different from that obtained thereafter	*Figure 1. Amplified human herpesvirus-6 DNA sequences in saliva, stool, and urine samples obtained at various times after onset of exanthem subitum: (a) saliva, (b) stool, (c) urine. Closed circle, HHV-6 DNA positive; open circle, HHV-6 DNA negative. Shaded area in (b) indicates the time when the child had diarrhea. 	*Figure 2. Amplified human herpesvirus-6 DNA sequences in peripheral blood mononuclear cells and plasma obtained at various times after onset of exanthem subitum: (a) peripheral blood mononuclear cells; (b) plasma. Closed circle, HHV-6 DNA positive; open circle, HHV-6 DNA negative. Arrows in (a) indicate the time when HHV-6 was isolated from peripheral blood mononuclear cells by culture technique. 	Comments: *All children had fever and rash, 15 had diarrhea, 2 had febrile convulsion Limitations: *Main results for virus in blood *HHV-6 DNA was detected in all MNC samples obtained between days 0 (the first day of elevation of fever) and 4 of the disease and between days 5 and 60-90, except in 2 cases *HHV-6 DNA in plasma was positive in 16/20 infants between days 0 and 4, but not later than day 5

DNA: deoxyribonucleic acid ES: exanthem subitum; HHV-6: human herpesvirus 6; M/F-ratio: male-to-female ratio; MNCs: mononuclear cells; PCR: polymerase chain reaction

Fifth disease (erythema infectiosum, parvovirus infection) (n=0)

Staphylococcal impetigo (n=0)

Healthcare associated infections (n=0)