

**European Surveillance of
Antimicrobial Consumption
(ESAC):
Results from the national survey
of characteristics of nursing
homes**

ESAC-3: Nursing Home Subproject Group



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LIST OF ABBREVIATIONS

AB	Antibiotic
ADL	Activity of Daily Living
CP	Co-ordinating Physician
ESAC	European Surveillance of Antimicrobial Consumption
GP	General Practitioner
ICP	Infection Control Practitioner
IPSE	Improving Patient Safety in Europe
LOS	Length of Stay
NH	Nursing Home
NR	National Representative
NS	National Survey
PPS	Point Prevalence Survey

SUMMARY

The European Surveillance of Antimicrobial Consumption (ESAC) nursing home subproject aims to measure the prevalence of antibiotic (AB) consumption in European nursing homes (NHs). In preparation of the point prevalence study (PPS) in NHs a national survey was performed with the aim of gaining insight in NH care on national level in the different European countries.

By means of a questionnaire, with four categories of questions, a global image of NH care was obtained. The questionnaire was filled in by the National Representative of each country assisted by other national experts, if necessary. Twenty-one European countries participated in the national survey.

The first category comprised questions with regard to characteristics of NHs and NH residents, more specifically the number of NHs, the number of NH beds, the mean NH size, the mean bed occupation rate and the mean length of stay were investigated. Also, information on ownership of NHs, official registration of NHs, the types of care offered in NHs, applied norms to NH care and the use certain restriction criteria and evaluation scores and scales applied to NH care was gathered, among other topics.

The second category comprised questions on the organisation of medical and nursing care in NHs and aimed to gain insight into the present medical and nursing care providers and the co-ordination of medical and nursing activities.

The third category comprised questions on AB policy with respect to the prescribers and deliverers of ABs. In addition, the presence of guidelines concerning AB use and restriction and evaluation of AB use was queried.

The final category of questions concerned infection control practices. The existence of an infection control practitioner was investigated as well as the type of infection control practices.

In addition to presenting the results from the national survey, this report also provides a comparison between the national survey results, the global image of NH care on national level, and the results from the first PPS, on NH level.

This report furthermore contains a summary of the results of the national survey for each individual country.

Overall, this report gives a broad image of the standards of NH care in Europe and clearly shows that there is a large variety between these standards, amongst others with respect to NH size, organization around care givers, applied norms and restriction criteria and with respect to AB policy and infection control practices.

1 - INTRODUCTION

There is increasing demand for non-acute healthcare in long-term care facilities or through home care as result of an aging (European) population (1;2).

The subjects of infectious diseases and resistance against micro-organisms are gaining importance in long-term care facilities (3).

Earlier estimations have shown that the prevalence of healthcare-acquired infections in nursing homes (NHs) varies between 2.7 and 32.7 infections per 100 residents. Most common are infections of the urinary tract, respiratory tract, skin, gastrointestinal tract and eye (4).

One of the likely problems related to infection control in NHs is the use of inappropriate antibiotic (AB) therapies (5;6).

The project 'Improving Patient Safety in Europe (IPSE)' (EC/DG SANCO, grant no. 2004216) took into account the increasing importance of collecting data in long-term care facilities and gathered information on characteristics of European NH care like type of residents, infection control and surveillance, AB and antimicrobial resistance policies (4).

The European Surveillance of Antimicrobial Consumption (ESAC) nursing home subproject aims to measure AB consumption prevalence in NHs throughout countries in Europe. Also determinants of AB use are studied on both institutional and resident level. To be able to interpret results and adjust analyses of AB prevalence in light of the NH characteristics in each country, knowledge of characteristics of NHs at country level is necessary. Therefore, preceding the ESAC point prevalence surveys in NHs a national survey (NS) was conducted containing questions on NH characteristics on national level in order to gain a broad overview of European NH care and to have recent results.

This report provides a comprehensive overview of NH characteristics, such as the number of NHs per country, NH size on average, ownership of NHs, etcetera. Furthermore, information on the organisation and co-ordination of nursing and medical care, organisation of AB policy and infection control practices is included.

2 - METHODS

2.1 - Aims

The aim of the present report is to describe the characteristics of NHs throughout Europe. The data on characteristics and organisation of care were collected in order to be able to take into account differences between NHs and between countries.

2.2 - Tools

A questionnaire was sent to the national representatives (NRs) that were active in the umbrella ESAC study (in hospitals) of each of the twenty-one participating countries.

The NS was sent in August 2008 and results were retrieved during October 2008. It was asked to redirect the survey to persons with proficient, or at least better, knowledge of the national NH system. Since it was expected that NHs and NH populations are different between and within countries an attempt for a uniform definition for NH care was proposed.

The following was therefore applicable for a NH: an institution where elderly stay temporarily (long or short) or permanently. The residents of NHs are in need of constant

supervision, in need of high skilled nursing care (i.e. more than basic nursing and assistance with activities of daily living), are medically stable and do not need constant specialised medical care or invasive medical procedures. In these institutions most often registered nursing staff is present during 24 hours and different types of residents are treated in the facility.

The NH survey questions were classified into four categories:

The first category contained questions on the characteristics of high skilled NHs and NH residents. The second category comprised questions on the organisation of medical and nursing care in high skilled NHs. In the third category, the survey included questions on AB policy in the NHs. In the fourth category, the survey inquired about infection control practices in the NHs.

In total 40 questions, and subsequent sub-questions, were included in the survey. The specific questions can be found in Appendix 1.

The NS also included definitions of used concepts and terms, in order to remove confusion with definitions of these concepts. This included a list of abbreviations and definitions for used terms, e.g. the concept NH, several types of care, health problems of residents and infection control personnel.

The data from the participating countries were analysed by means of spread sheets, Epi Info, and Stata 10.0.

3 - RESULTS

3.1 - Participation

Twenty-one European countries participated in the NS:

Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Malta, the Netherlands, Norway, Poland, the Russian Federation, Slovenia, Sweden, United Kingdom (UK) (England, Northern Ireland and Scotland).

The results have been divided according to the four categories mentioned above. A short summary of the results per country and more specific information for countries can be found in Appendix 5.

3.2 - Characteristics of high skilled nursing homes and nursing home residents

Table 1 depicts an overview of the availability of NH care and the accessibility for the target population in each country. Data on the number of NHs and the number of beds (sometimes estimated since accurate data are frequently not available) from the survey were combined with data on population per country.

Table 1: Number of NHs and NH beds available by country

Country	Number of NHs	Number of NH beds	Total population (x 1000) ^a	Population over 60 years (% of total ^a)	Number of inhabitants over 60 years per NH bed	Number of NH beds per 100 inhabitants over 60 years.
Belgium	1,090	107,540	10,590	2,243,570 (23%)	21	4.8
Croatia	114	14,807	4,423	1,017,290 (23%)	69	1.5
Czech Republic	67	n.a.	10,319	2,166,990 (21%)	n.a.	n.a.
Denmark	1,080 ^b	44,840	5,458	1,255,340 (23%)	28	3.6
Finland	448	19,016	5,304	1,219,920 (23%)	64	1.6
France	6,223 ^b	460,000 ^b	62,036	13,647,920 (22%)	30	3.4
Germany	10,400	757,186	82,264	21,388,640 (26%)	28	3.5
Hungary	n.a.	n.a.	10,012	2,202,640 (22%)	n.a.	n.a.
Ireland	n.a.	n.a.	4,437	709,920 (16%)	n.a.	n.a.
Italy	1,273	87,360	59,604	15,497,040 (26%)	177	0.6
Latvia	118	10,532	2,259	496,980 (22%)	47	2.1
Malta	5	330	407	81,400 (20%)	247	0.4
Netherlands	345	65,000	16,528	3,470,880 (21%)	53	1.9
Norway	1,003	40,000	4,767	953,400 (20%)	24	4.2
Poland	904 ^c	67,030 ^c	38,104	6,858,720 (18%)	102	1.0
Russian Federation	n.a.	n.a.	141,394	24,036,980 (17%)	n.a.	n.a.
Slovenia	80	15,690	2,015	423,150 (21%)	27	3.7
Sweden	2,700	95,000	9,205	2,209,200 (24%)	23	4.3
UK			61,231	13,470,820 (22%)	n.a. ^d	n.a. ^d
England	n.a.	80,000				
Northern Ireland	252	10,339				
Scotland	1447	43,697				

n.a.: Not available, no data registered

^a 2008, WHO data

^b Estimated

^c Excluding institutions for mental and psychiatric residents

^d Could not be calculated because of lack of data from Wales

The results of the number of NH beds per 100 inhabitants over 60 years and the results of the number of inhabitants over 60 years for which one NH bed is available, for the countries for which these numbers could be calculated are shown in Figures 1 and 2.

Figure 1: Number of beds per 100 inhabitants over 60 years

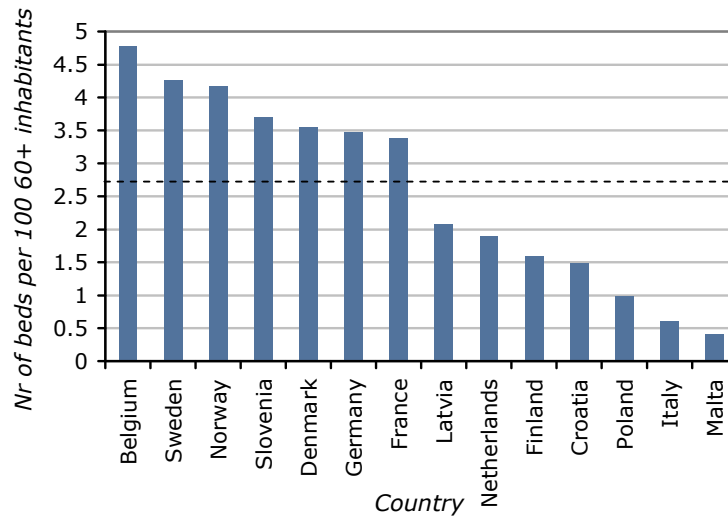
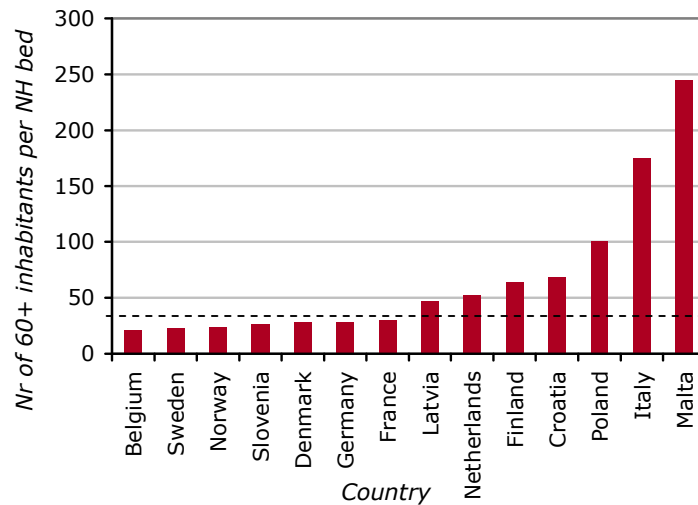


Figure 2: Number of inhabitants over 60 years per NH bed



The median number of NH beds per 100 elderly is 2.75 (dotted line in Figure 1). The median value of the number of inhabitants over 60 years per NH bed is 38.5 (dotted line in Figure 2). It can be hypothesized that countries above the median in Figure 1 and below the median in Figure 2 have a large availability of NH beds for their elderly population. The availability is determined by many factors. The structure of care in a country, the available (financial) resources, the policies for NH care and the organization of the substitute of home care or other types of collective health care structures for elderly determine demand as well as the magnitude of the elderly population and cultural aspects. In many countries, demand is determined by culture in the sense that the majority of the elderly will leave their homes only when their level of dependency and their need for care is already very high. In Belgium care in earlier phases of old age or deteriorating health is covered by a stable and well-developed home care system (7). In Croatia only 2% of the persons over 65 years, of an aging population, is living in a healthcare institution, as a result of the economic situation after the war amongst other possible reasons. Most elderly live at home or with family (8). Also in Poland most elderly in need of care live with family members (9). In Denmark the number of NHs decreased in the recent years while at the same time the amount of home care services increased

(2;10). In Norway the number of NH beds decreased because of a trend towards more single rooms. Also, home care is constructed in such a way that elderly can stay at home as long as possible (11). In Czech Republic, Hungary, Latvia and the Russian Federation the health care system was reformed during the last 20 years (and is still in a transitional phase) (12-15). Slovenian long-term care, including NH care and home care is (also) still in a phase of development (16). In Latvia the number of NHs is increasing while home care is developing as well (14).

Other characteristics of NH care, including size of NHs, mean occupation rate, mean length of stay and ownership of NHs are summarized in Table 2.

Table 2: Size, occupation rate, length of stay and ownership of NHs

Country	Mean size of NHs (beds/NH)	Mean bed occupation rate in NHs (%)	Mean length of stay in NHs (months)	Ownership of NHs
Belgium	99	97.2% ^a	46 ^a	Both public and private
Croatia	130	99% ^a	60 ^a	Both public and private
Czech Republic	60 ^a	87.5% ^a	2 ^a	Public
Denmark	36 ^a	96.6%	n.a.	Both public and private
Finland	42 ^b	100% ^a	23.6 ^a	Both public and private
France	74 ^a	95% ^a	36 ^a	Both public and private
Germany	73	68.5%	n.a.	Both public and private
Hungary	n.a.	n.a.	n.a.	n.a.
Ireland	83 ^a	96% ^a	36 ^a	Both public and private
Italy	69 ^b	<90% ^a	2 ^a (median)	Both public and private
Latvia	89 ^b	95.7%	n.a.	Both public and private
Malta	66 ^a	100% ^a	n.a.	Public
Netherlands	188 ^b	100% ^a	17.5	(Majority) public
Norway	40 ^b	100% ^a	n.a.	Both public and private
Poland	74 ^b	100% ^a	n.a.	Both public and private
Russian Federation	350 ^a	100% ^a	3-4/ 60-120	Public
Slovenia	196 ^b	100%	48 ^a	Both public and private
Sweden	34	99% ^a	n.a.	Both public and private
UK				
England	40 ^a	90% ^a	12 ^a	Both public and private
Northern Ireland	41 ^b	>95% ^a	27 ^c	(Majority) private
Scotland	30	95% ^a	n.a.	Both public and private

n.a.: Not available, no data registered

^a Estimated

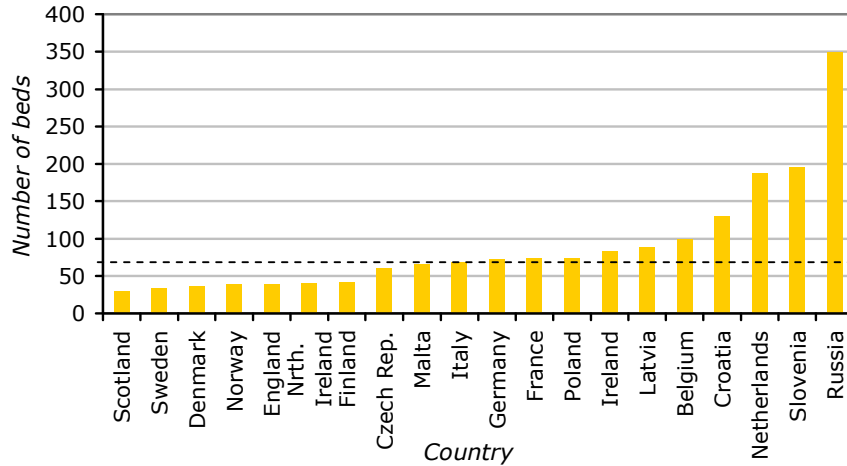
^b Calculated with number of beds and number of NHs from table 1

^c Retrieved from a trial

Most countries (n=16) have a mean occupation rate of 95%-100%. Germany has a notable lower occupation rate compared to the other countries.

Large differences are seen between countries in the size of NHs (Figure 3). The median of the mean size of NHs for all countries is 71 beds (dotted line in Figure 3), the mean for all countries is 90.7 beds.

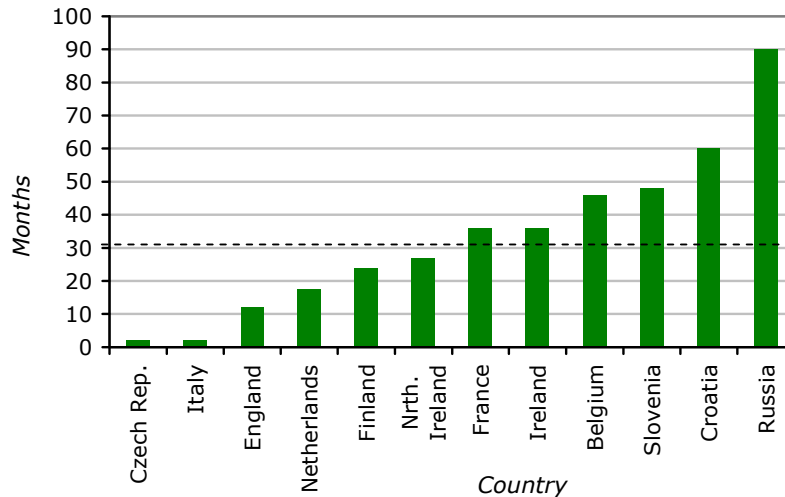
Figure 3: Mean size of NHs



Only for Denmark the registered mean size of NHs is smaller than calculated using the number of NHs and the number of NH beds. This indicates that for most countries the mean size was determined using the data from Table 1 rather than calculating exact numbers using the accurate size of each NH in the country. The mean NH size can be tailored by available resources, by culture (i.e. whether the standard is to have large NHs or small scaled NHs; small NHs can be the result of a strive to appear more home-like) or by demand, e.g. low population density causes low demand for NH beds in certain regions which can result in small sized NHs.

The mean length of stay (LOS) in NHs is depicted in Figure 4.

Figure 4: Mean length of stay in NHs



The median LOS is 31.5 months (dotted line in Figure 4). Again, there is great variation between the countries. The Russian Federation noted having a wide variation in LOS, from three to four months for rehabilitation institutions to five to ten years, until the end of life, for other types of NHs (the majority). Italy used the result from a study to indicate the LOS however this result might not be representative for NHs at country level. The relatively short LOS in Czech NHs might be the result of the health care system (for

elderly) still being under development. The difference in LOS can depend on the characteristics of NH care (temporarily or permanent) or on characteristics of residents (e.g. health and age) and can be determined by culture (phase of life or expected years of life when admitted to a NH). Furthermore, the calculation method (influenced by administrative issues) for LOS can differ between institutions and/or between countries. While some NHs calculate LOS for one resident from the first day of admission until final discharge (or death), others subtract days admitted to a hospital during NH admission from the total LOS.

In all countries NHs are officially registered (for Hungary this information was not available). There are however large differences between the levels of registration of NHs. The same applies for recognition procedures. The different levels of registration and recognition in countries can be found in Table 3.

Table 3: Officially registration and recognition levels

Level	Registered NHs ^a	Recognized NHs ^b
National	Belgium, Croatia, Czech Republic, Finland, Germany, Ireland, Italy, Latvia, Malta, Netherlands, Slovenia, England, Scotland	Belgium, Croatia, Czech Republic, Hungary, Latvia, Malta, Netherlands, Slovenia, Northern Ireland
Regional	Germany, Italy, Poland, Russian Federation, Sweden, Northern Ireland	Belgium, Germany, Russian Federation, Sweden
Local	Croatia, France, Norway	France
Unknown (no level specified)	Denmark	Denmark, Finland, Italy, Poland

^a Officially registered: existence of an official list with addresses and characteristics (i.e. number of beds, type of institution and contact person) of all NHs

^b Officially recognized: fulfilling some official (national/regional/local) criteria, for which accreditation procedures are in place, in order to be labelled as NH.

The specific registration and recognition bodies for each country can be found in Appendix 2. The variation in level of registration can result in difficulties with the accuracy of the national number of NHs. In some countries it might be difficult to obtain an exact number of NHs when these are registered at local level with possibly differing registration systems.

In all countries NHs are regulated by law and are subordinated to meet certain norms. In all countries (no information for Slovenia) these norms are determined at national level. In Denmark, Italy, the Netherlands, the Russian Federation and Sweden norms exists at national, regional and local level. In Belgium and Germany there are national and regional norms. In France there are local norms next to the national ones. Norms can exist covering a variety of topics. Table 4 explains which norms are applicable in the participating countries.

Table 4: Norms applicable in NHs

Country	Planning of beds	Architectonic	Minimum required nursing staff	Organisation of nursing care	Organisation of medical care	Quality of care	Safety
Belgium	+	+	+	+	+	+	+
Croatia	+		+				
Czech Republic			+	+	+	+	
Denmark				+	+	+	+
Finland			+	+	+	+	+
France	+	+		+	+	+	+
Germany	+	+	+			+	
Hungary	+		+	+			
Ireland	+	+	+	+	+	+	+
Italy	+	+	+	+	+	+	+
Latvia		+			+	+	+
Malta	+		+			+	+
Netherlands	+		+	+	+	+	
Norway	+	+	+	+	+	+	+
Poland	+	+	+	+	+	+	+
Russian Federation	+	+	+	+	+	+	+
Slovenia	+	+	+	+	+	+	+
Sweden	+	+	+		+	+	+
UK							
England	+	+	+	+	+	+	+
N. Ireland	+	+	+	+	+	+	+
Scotland						+	+
Total no (%)	16 (76%)	13 (62%)	17 (81%)	15 (71%)	16 (76%)	19 (90%)	16 (76%)

In order to check the conformity with norms, most countries, except Hungary, execute inspections or control visits. This is performed by a wide variety of institutions (from specialised Inspection boards to Ministries of Health). Detailed information on the bodies that perform inspection visits is described in Appendix 3.

There are several types of care representative for NH care. [1] Palliative care is supplied to residents with incurable syndromes or diseases in need of palliative support during their end of life. [2] Specialised medical care is aimed at a specified illness, e.g. multiple sclerosis and Parkinson's disease. [3] Basic care comprises assistance to conduct for activities of daily living (ADL), e.g. feeding, bathing, dressing and moving. [4] High skilled nursing is offered to medically stable residents not in need of invasive medical procedures but who require constant supervision by nursing staff and more than basic nursing care. [5] Hotel service means providing lodging, meals and additional accommodation facilities. [6] Revalidation consists of care focused on re-acquisition of autonomy often after an acute health incident aimed at return of the resident to their homes, or to a nursing or housing facility. [7] Convalescence is care aimed at recovery of health and strength after illness before returning home or to a housing facility. Countries vary in supplying each kind of care in NHs (Table 5).

Table 5: Types of care offered in NHs

Country	Palliative care	Specialised medical care	High skilled nursing	Basic care and ADL assistance	Hotel service	Revalidation	Convalescence	All of these in all wards (mixed wards)	All of these in separate wards (specialised wards)
Belgium								+ ^a	
Croatia									+ ^a
Czech Republic			+	+		+	+		
Denmark	+		+	+		+	+		
Finland	+		+	+		+	+		
France								+	
Germany								+	
Hungary								+ ^a	+ ^a
Ireland									+
Italy		+	+	+	+	+			
Latvia								+	+
Malta				+	+				
Netherlands	+		+	+		+	+		
Norway	+		+	+					
Poland									+
Russian Federation								+	
Slovenia								+	
Sweden								+ ^a	+ ^a
UK									
England	+		+	+		+	+		
N. Ireland								+	+
Scotland	+		+	+	+		+		
Total no (%), incl. "all types"	18 (86%)	13 (62%)	20 (95%)	21 (100%)	15 (71%)	18 (86%)	18 (86%)	9 (43%)	7 (33%)

^a "All of these" was chosen but some types of care were specified separately, the latter were not considered, interpreted as all types of care supplied in NHs

In all countries NHs offer ADL assistance and in almost all countries high skilled nursing is offered. Twelve (57%) of the countries offer all types of care, either in mixed or in separate wards.

NH wards or NHs without separate wards are not only defined by type of care, but also by type of resident stay typical for the countries. [1] Acute wards are transitional wards where residents stay for a short period of time (comparable to stay in an acute care hospital). [2] Sub-acute wards are transitional wards with medium LOS (LOS usually longer than in acute care hospitals). [3] In chronic wards residents stay for a long time (weeks to months) but the wards are still transitional wards not allowing definitive stay. [4] Definitive wards are not transitional; residents stay definitively. [5] Terminal and palliative care wards are distinguished from definitive wards by offering definitive stay to residents with an incurable disease or syndrome at the end of their life. Countries differ in types of resident stay offered in their NHs (Table 6).

Table 6: Type of resident stay in NHs

Country	Acute ward (short stay)	Sub-acute ward (medium stay)	Chronic ward (long stay)	Definitive	Terminal, palliative care (end of life)	Mixed (all or some in the same NH)
Belgium				+	+	+
Croatia						+
Czech Republic			+			
Denmark			+	+		
Finland			+	+	+	
France				+	+	+
Germany				+		
Hungary			+	+	+	+
Ireland						+
Italy		+				
Latvia			+			
Malta			+			
Netherlands			+	+		
Norway		+	+	+	+	+
Poland			+			+
Russian Federation				+		
Slovenia						+
Sweden						+
UK						
England				+		
N. Ireland			+	+	+	+
Scotland		+	+	+	+	

The type of resident stay should be reflected in the mean LOS (as in Table 2). Italy offers sub-acute care in NHs, this is reflected in the mean LOS of only two months. Czech Republic with a mean LOS of two months as well, surprisingly indicates having chronic NH care. For the Netherlands, Finland and Northern Ireland offering a mix of chronic and definitive care, the registered LOS is according to expectation; below the median but relatively long. Belgium, France and the Russian Federation have a relative long LOS as in accordance with offering mainly definitive NH care. The countries with mixed types of resident stay, Croatia, Ireland and Slovenia have a relatively long LOS which is likely an indicator for having more NHs offering long-stay care than short-stay care, but these proportions are not known. The Russian Federation registered, next to a long LOS for long-stay care, a short LOS of three to four months for rehabilitation, although the Russian Federation did not indicate having short or medium stay care.

LOS does not necessarily reflect the type of resident stay. Comparable to accessibility and the amount of beds in NHs, also LOS can be determined by culture. LOS is likely to be shorter when elderly are admitted to NHs at very old age or with health problems that are in an advanced phase and hence with a relatively shorter life expectancy.

In all countries NHs have waiting lists in order to be admitted to a NH. Occupation rate (Table 2), should be related with the existence of waiting lists. It is indeed the case that countries that indicate the lowest mean occupation rates register having waiting lists only for some NHs. Also, most of the countries having the highest mean occupation rates have waiting lists for all NHs. Deviations, in the sense that countries with a mean occupation rate of 100% have waiting lists in only some NHs and countries with a mean occupation rate of less than 100% have waiting lists for all NHs, could be explained by the fact that

mean values are used, or by the fact that the occupation rate is not only determined by demand, but might be influenced by for example required staff and financial resources.

Some countries apply inclusion and exclusion criteria for admission to NHs or for inclusion on a waiting list. These requirements can be divided in different categories. Within these categories countries can differ from each other on the specific standard set by the requirements. The different categories of requirements applied in countries that use restrictions to admission in NHs is shown in Table 7.

Table 7: Requirement and restriction categories for admission to NHs

Country	In all or some NHs	Age	Physical condition	Mental condition	Infectious condition	Other
Belgium	Some	+	+	+		+
Croatia	All			+		
Denmark	All		+	+		
Finland	n.a.		+	+		
France	Some		+	+		
Hungary	All				+	
Ireland	Some	+		+	+	
Italy	All					+
Latvia	n.a.			+	+	
Malta	All	+				
Netherlands	All		+	+		
Poland	All		+		+	
Russian Federation	All	+		+	+	
Slovenia	All	+			+	
Sweden	All	+	+			
UK						
England	Some		+	+		
Northern Ireland	Some	+	+	+		
Scotland	Some	+	+	+		
Total no (%)		8 (44%)	11 (56%)	12 (67%)	6 (33%)	2 (11%)

n.a.: Not available, no data registered

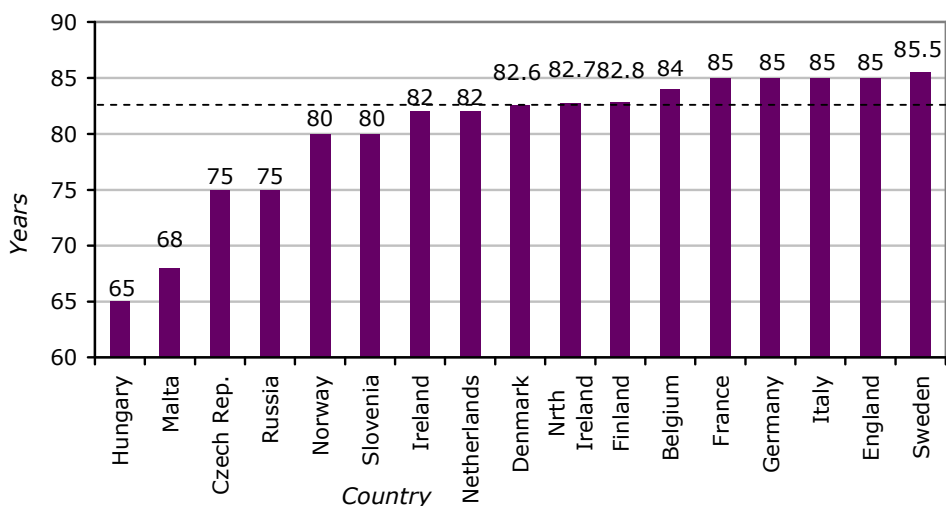
The contents of the requirements and restrictions are very different per country. Of notice, age restriction can vary in threshold (e.g. 60 vs. 65 years) and can be adjusted by gender and type of care. Furthermore, physical conditions including the presence of devices, certain type of transmissible infections and stage of disease (terminal, rehabilitation, convalescence) are exclusion criteria in some countries. Certain (stages of) mental conditions form exclusion criteria, varying in some countries between facilities, for which different scales are applied.

Infectious conditions, such as *Clostridium difficile* infection, tuberculosis and methicillin-resistant *Staphylococcus aureus*, are exclusion criteria in some countries as well.

Certain exclusion criteria might be used to manage and limit the admission to NHs in order for NHs to be accessible to elderly who really need admission. Also, exclusion criteria can divide elderly into persons eligible for NH care and persons more suitable for specialised institutions in certain types of care, e.g. with respect to psychiatric care. In addition, a certain inclusion criterion in one country can serve as exclusion criterion in another country. There is hardly any resemblance in the applied exclusion criteria and requirements between countries, possibly as result of different target populations.

The mean age of residents in NHs differs between some countries (Figure 5).

Figure 5: Mean age of NH residents



Most of the countries, except the Netherlands and Northern Ireland, indicated using an estimated value of mean age. Northern Ireland based the mean age on a trial. Norway was unable to indicate an estimated number and mentioned that 75% of the residents are most likely over the age of 80 years. The median value (dotted line in Figure 5) of mean age is 82.6 years (mean 80.3 years). It seems that mainly Eastern European countries and the smallest country participating show a low mean age. Possibly mean age can be low (or high for other countries), next to cultural influences, due to some outliers. Outliers in some countries can be the result of admission of physically disabled or psychiatric residents who can be much younger than the typical elderly NH population.

Certain features of NH care can be evaluated by certain scales or scores. Evaluating resident autonomy, mental status and care load are important in order to refer the resident to the type of facility that meets his care needs. Not all countries legally impose evaluations and if they do, countries do not use comparable scales or scores. Table 8 shows which countries use compulsory scores and scales to evaluate care load, dependency degree, risk (based on for example bed sores, infection, nutrition) and mental status.

Table 8: Use of compulsory evaluation scores and scales in NHs

Country	Care load (In all or some NHs?)	Dependency degree (In all or some NHs?)	Risk (In all or some NHs?)	Mental status (In all or some NHs?)
Belgium	No	All	No	No
Croatia	No	n.a.	n.a.	n.a.
Czech Rep.	No	No	Yes ^a	All
Denmark	All	All	All	All
Finland	No	Some	No	Some
France	All	All	Some	Some
Germany	All	No	No	No
Hungary	No	Some	Some	Some
Ireland	Some	Some	Some	Some
Italy	Some	Some	Some	Some
Latvia	All	No	No	Some
Malta	No	No	No	No
Netherlands	All	No	All	No
Norway	No	All	No	All
Poland	No	No	No	No
Russian Federation	No	No	No	No
Slovenia	No	No	No	No
Sweden	Some	Some	Some	Some
UK				
England	No	All	All	All
N. Ireland	All	All	All	All
Scotland	Some	Some	Some	Some
Total no (%)	10 (48%)	12 (60%)	11 (55%)	13 (65%)

^a Yes, scale/score registered, but unknown for all or for some NHs

With regard to care load, scales such as Katz, PATHOS and Resource Utilisation Groups-III are applied. For the second evaluation topic, dependency degree, among others the Barthel ADL index, the Katz scale, the Berger scale and the GIR scale are used.

For assessing risks a wide variety of scales and scores are used since there is also a wide variety of risk factors applying to the NH population. For example, the Waterlow score, Braden score, Exton Smith and Norton plus are used to assess pressure ulcer risks. Furthermore, malnutrition can be assessed by the Mini Nutritional Assessment. Also the risk for falling can be assessed by the Tinetti and Conley scale. Several scales are applied in more than one country.

Mental status is in quite some countries scored by means of, among others, the Mini Mental State Examination, the Neuropsychiatric Inventory score and the Geriatric Depression scale. Appendix 5 also includes more specific the use of scales per country and Appendix 6 contains more elaborate information on the applied scales and scores.

To see whether having exclusion criteria and using (compulsory) evaluation scores and scales inter-relate Table 7 and 8 can be compared. Almost all countries, except for Poland, which apply exclusion criteria for physical condition, have evaluation scores for care load, dependency degree and/or risk. It is notable that one-third of the countries that exclude residents based on mental condition do not to use scores or scales for mental status. However, mental status might be included for some of these countries in other types of evaluations.

3.3 - Organisation of medical and nursing care in high skilled nursing homes

There can be different types of care providers active in delivering medical care in NHs. Care to NH residents can be delivered by the resident's personal general practitioner (GP) or a physician from the same medical group practice. It is also possible that medical doctors are employed by the NH. In some NHs or countries both personal GPs and medical doctors are commonly employed by the NH deliver care to NH residents. Table 9 summarises which care providers are present in NHs for each country.

Table 9: Medical care providers in NHs

Country	Personal GP. (In all or some NHs)	Medical staff employed by the NH. (In all or some NHs)	Both: GPs and medical staff employed by the NH. (In all or some NHs)
Belgium	All		
Croatia	All		
Czech Republic		All	
Denmark			All
Finland	Some	Some	Some
France	All		
Germany	Some	Some	
Hungary	Some	Some	Some
Ireland	Some	Some	
Italy	Some	Some	Some
Latvia			All
Malta			All
Netherlands		All	
Norway	Some	Some	Some
Poland	Some	Some	Some
Russian Federation		Some	Some
Slovenia	All? ^a	All? ^a	
Sweden	Some	Some	
UK			
England	All		
Northern Ireland	All		
Scotland	All		

^a Not personal GP, not doctor employed by NH but a GP employed by public health system

It is clear that there are diverse systems of NH care for the different countries. There is no clearly visible trend in who delivers NH care for all countries. About half of the participating countries however do not have a predefined system at national level; the medical care providers vary by NH.

A co-ordinating physician (CP) can be appointed in order to centralise responsibility for care for all NH residents and/or responsibility for all NH care delivers, either NH doctors or GPs. Even when there is no medical staff employed by the NH it is possible that an external co-ordinating medical care giver is assigned to manage the medical activities in the NH. The existence of such a co-ordinating medical doctor or physician (CP) can be enforced by law, as his specialty, tasks and time spent on co-ordinating the medical activities. This varies between countries (Table 10).

Table 10: Co-ordination of medical activities in NHs

Country	CP present? (In all or some NHs?)	CP presence compulsory? (In all or some NHs?)	Specialty required?	Type of required specialty?				CP tasks described by law?	Time co-ordinating by CP described by law?
				General practice	Internal medicine	Geriatrics/gerontology	Other		
Belgium	Yes, all	Yes, all	Yes	+		+		Yes	Yes
Croatia	No	-	-					-	-
Czech Republic	Yes, all	Yes, all	No		+ ^a	+ ^a		Yes	No
Denmark	No	-	-					-	-
Finland	Yes, some	No	-					No	No
France	Yes, all	Yes, all	Yes			+	+	Yes	Yes
Germany	No	-	-					-	-
Hungary	Yes, some	No	-					No	No
Ireland	Yes, some	No	-					No	No
Italy	Yes, some	No	-					-	-
Latvia	Yes, all	No	Yes	+				Yes	No
Malta	No	-	No					No	No
Netherlands	Yes, all	n.a.	Yes				+	Yes	n.a.
Norway	Yes, all	Yes, all	No					Yes	No
Poland	No	-	-					-	No
Russian Federation	Yes, all	Yes, all	No					Yes	Yes
Slovenia	Yes, all	Yes, all	No					No	Yes
Sweden	Yes, some	Yes, some	Yes	+		+		Yes	No
UK									
England	No	-	-					-	-
N. Ireland	No	-	-					-	No
Scotland	No	-	-					-	-

n.a.: Not available, no data registered

- answer only needed if first or second question was answered with yes

^a answer given, though registered that no specialty is required officially

In thirteen countries there is a CP present in the NHs, though this is only compulsory by law in seven of these countries. Hence, many NHs and/or countries take the initiative, without being enforced by law, to create a co-ordinating role. In only five countries, in which a CP in NHs is compulsory, specific requirements, i.e. a certain specialty, have to be met in order to be qualified for the job of CP. In most cases this specialty is geriatrics/gerontology or general practice. In eight countries the tasks of a CP are described by law. Four countries regulated the time spent on co-ordination activities by a CP.

In some countries, medical co-ordination can also be executed by an external physician, or by a co-ordinating nurse, often responsible for co-ordination of several settings or for all primary care settings (sometimes including home care) from the same geographical area.

A variety of tasks of the CP can be compulsory by law. For the countries which have regulated tasks (as laid down by law) for the CP the obligatory tasks are shown in Table 11.

Table 11: Legally regulated tasks of CPs in NHs

Task of CP	Country									Total no (%)
	Belgium	Czech Republic	France	Latvia	Netherlands	Norway	Russian Federation	Sweden		
Medical resident care		+		+	+	+	+	+	6 (75%)	
Organising the medical on-call service	+	+	+	+	+		+	+	7 (88%)	
Supervising the medical records	+	+	+	+	+		+	+	7 (88%)	
Training of medical doctors	+	+	+		+		+	+	6 (75%)	
Training of nursing staff	+	+	+				+	+	5 (63%)	
Development of an AB policy	+	+	+						3 (38%)	
Development of care strategies	+	+	+	+			+		5 (63%)	
Development of infection prevention policy	+	+	+				+		4 (50%)	
Co-ordinating resident vaccination policy		+	+	+			+		4 (50%)	
Organising GP meetings to harmonise medical care practices and policies	+		+	+			+		4 (50%)	
Peer review of medical activities			+				+		2 (25%)	

Not only the type of medical care providers, their background and responsibilities matter. In NHs also nursing care constitutes an important part of daily care. Different nurses, certified or not and employed by the NH or not, can deliver NH care. Also, in some countries there are head-nurses or other nursing care providers responsible for the NH, like the CP is in the field of medical care. Data on the type of nursing care providers and on the (compulsory) co-ordination are shown in Table 12.

Table 12: Organisation of nursing care in NHs

Country	Type of nursing care providers				Co-ordination by nursing responsible? (In all or some NHs?)	Presence nursing responsible compulsory by law? (In all NHS in country or in some regions?)
	Certified home care nurses (CHCN). (In all or some NHs?)	Certified nurses employed by NH (CEN). (In all or some NHs?)	Both CHCN and CEN. (In all or some NHs?)	Uncertified HC or employed nurses. (In all or some NHs?)		
Belgium		Yes, all		Yes, all	Yes, all	Yes, all
Croatia		Yes, all			Yes, all	Yes, all
Czech Rep.		Yes, all			Yes, all	Yes, all
Denmark	Yes, some	Yes, some			Yes, some	No
Finland	Yes, some	Yes, all		Yes, some	Yes, all	Yes, all
France			Yes, all		Yes, some	No
Germany		Yes, all		Yes, all	Yes, all	No
Hungary		Yes, all			Yes, all	Yes, all
Ireland		Yes, all			Yes, all	Yes, all
Italy		Yes, all	Yes, some		Yes, all	Yes, some
Latvia			Yes, n.a.		Yes, all	Yes, all
Malta		Yes, all			Yes, all	n.a.
Netherlands		Yes, all		Yes, all	Yes, all	n.a.
Norway		Yes, all			Yes, all	Yes, all
Poland	Yes, some	Yes, some	Yes, some	Yes, all	Yes, all	Yes, some
Russian Fed.		Yes, all			Yes, all	Yes, all
Slovenia		Yes, all			Yes, all	Yes, all
Sweden		Yes, all			Yes, all	Yes, all
UK						
England		Yes, all			Yes, all	Yes, all
N. Ireland		Yes, all			Yes, all	Yes, all
Scotland	Yes, some	Yes, some		Yes, some	Yes, some	No

n.a.: Not available, no data registered

Quite some countries make use of uncertified nurses, often due to the lack of qualified nurses. It is likely that among these uncertified nurses there are nurses in education doing on-the-job training. In none of the countries there is only nursing care by uncertified nurses. It seems that there is always a combination of certified and uncertified nurses, although no straightforward conclusions can be drawn for single NHs. The same applies to home care nurses.

The fact that in all participating countries (though not in all NHs) a nursing responsible is present, shows that many NHs or countries take, without obligation, the initiative to construct a role for a responsible for the nursing care or above the nursing personnel. Just like many countries appoint a responsible for medical care (Table 10).

The fact that a medical doctor and a nurse are part of the care processes does not mean that they are available in all NHs at all times. In some NHs a doctor or nurse can not be physically present at all times. To set off for absence it is possible that there is a system for doctors or nurses to be reachable by phone. The standards for presence and contactability of doctors and nurses in different countries can be found in Table 13.

Table 13: Presence of medical and nursing staff in NHs

Country	Medical doctor				Certified nurse			
	During the day		During the night		During the day		During the night	
	Reachable. (In all or some NHs?)	Physically present. (In all or some NHs?)	Reachable. (In all or some NHs?)	Physically present. (In all or some NHs?)	Reachable. (In all or some NHs?)	Physically present. (In all or some NHs?)	Reachable. (In all or some NHs?)	Physically present. (In all or some NHs?)
Belgium	Y., all	No	Y., all	No	Y., all	Y., all	Y., all	Y., all
Croatia	n.a.	Y., some	No	No	Y., all	Y., all	Y., all	Y., some
Czech Rep.	n.a.	Y., all	n.a.	Y., all	n.a.	Y., all	n.a.	Y., all
Denmark	Y., all	No	Y., all	No	Y., some	Y., some	Y., some	Y., some
Finland	Y., all	Y., some	No	No	Yes, all	Y., all	Y., all	Y., all
France	Y., all	No	No	No	Y., some	Y., all	Y., some	Y., some
Germany	Y., all	Y., some	Y., all	No	Y., all	Y., all	Y., all	Y., some
Hungary	Y., all	Y., some	Y., some	Y., some	n.a.	Y., all	Y., all	Y., some
Ireland	Y., all	Y., some	Y., all	Y., some	Y., all	Y., all	Y., all	Y., all
Italy	Y., all	Y., some	Y., all	n.a.	n.a.	Y., all	n.a.	Y., all
Latvia	Y., some	Y., some	No	No	Y., all	Y., all	Y., n.a.	Y., all
Malta	Y., all	No	n.a.	No	Y., all	Y., all	Y., some	Y., some
Netherlands	Y., all	Y., all	Y., all	No	Y., all	Y., all	Y., all	Y., all
Norway	Y., all	Y., some	Y., all	No	Y., all	Y., all	Y., all	Y., all
Poland	Y., some	Y., some	No	No	Y., all	Y., all	Y., all	Y., all
Russian Fed.	n.a.	Y., all	Y., all	Y., some	n.a.	Y., all	n.a.	Y., all
Slovenia	Y., all	n.a.	n.a.	n.a.	Y., all	Y., all	Y., all	Y., all
Sweden	Y., all	Y., some	Y., all	No	Y., all	Y., some	Y., all	Y., some
UK								
England	Y., all	No	Y., all	No	Y., all	Y., all	Y., all	Y., all
N. Ireland	Y., all	No	Y., all	No	Y., all	Y., all	Y., all	Y., all
Scotland	Y., all	No	Y., all	No	Y., some	Y., some	Y., some	Y., some
Total no (%)	18 (100%)	13 (65%)	13 (72%)	4 (21%)	17 (100%)	21 (100%)	19 (100%)	21 (100%)

Y.: yes n.a.: Not available, no data registered

Some countries did not answer the question whether care providers are reachable by phone, possibly because physical presence makes contact by phone redundant. Three of the only four countries where a medical doctor is physically present during the night are Eastern European countries. Nursing staff is in more cases reachable and present than medical doctors.

3.4 - Antibiotic policy in the nursing homes

Table 14 shows which care providers can prescribe ABs in each country. A distinction is made between care providers who are responsible for prescribing ABs in most cases, those that are responsible sometimes and those that can never prescribe ABs in NHs.

Table 14: Prescribers of ABs in NHs

Country	GP	Medical doctor employed by NH	CP	Infection control practitioner ^a	Internal medicine specialist ^b	Pharmacist	Nurse	Other
Belgium	++	+	+	-	+	-	-	
Croatia	++							
Czech Rep.		++						
Denmark	++				+	-	-	
Finland	++	++	++	+	+	-	-	
France	++	+	-	-	-	-	-	-
Germany	++	+	-	-	+	-	-	
Hungary	++	++			++			
Ireland	++	+	+	-	+	-	-	
Italy	++	++	+	-	+	-	-	
Latvia	++	++		-	-	-	-	-
Malta	+	+						
Netherlands	+	++	+	-	-	-	-	-
Norway	+	++	+	-	-	-	-	-
Poland	++	+			+	-	-	
Russian Fed.	-	++	++	-	+	-	-	
Slovenia			++		+			
Sweden	++	++	++	-	-	-	-	
UK								
England	++	-	-	-	-	-	-	+
N. Ireland	++	-	-	-	-	-	+	
Scotland	++	-	-	-	-	-	-	
Total no	18	15	9	1	10	0	1	1

++: mostly +: sometimes -: never

^a An infection control practitioner can be a registered nurse, physician, epidemiologist or medical technologist whose task is to prevent healthcare-acquired infections through data research, to construct and implement public health practices and train healthcare staff.

^b An internal medicine specialist is concerned with diagnosis, management and treatment (not surgical) of unusual or serious diseases.

The registered prescribers can be interpreted as follows. If countries only filled in one prescriber carrying out AB prescription most of the times and left the answer blank for other prescribers, it might be interpreted that these other prescribers never or seldom prescribe ABs. Of course, for countries who registered 'never' for some prescribers this conclusion is straightforward. In these countries it might be that the care provider who never prescribes ABs is not allowed (by law) to prescribe ABs (in NHs).

The existence of more than one type of prescriber in NHs, as seen in a number of countries, can raise questions on harmonisation of AB prescriptions between prescribers and on responsibility for AB use. Evidently, from the table it can not be concluded that more than one prescriber is responsible for AB use in a single NH or for a single resident, or that different prescribers are active in all NHs in the country.

By comparing prescribers of ABs in NHs to the type of medical care providers (Table 9), some remarkable results became evident. The Netherlands registered not having GPs delivering NH care but they registered that GPs sometimes prescribe ABs in NHs.

Likewise, Belgium and France indicated not having doctors employed by the NH but let NH doctors (in some cases) prescribe ABs in NHs. These results raise questions on the accuracy of the answers or on possible (common) exceptions within the medical care system in NHs in these countries. To verify the role of the CP in prescribing ABs Table 14 can be compared to Tables 10 and 11. All countries indicating that CPs can prescribe ABs also indicate that a CP is present in NHs (not necessarily compulsory). Of the nine countries where a CP prescribes ABs, five countries had regulated tasks for the CP. Only in Belgium the CP is responsible for the AB policy.

Not only the prescriber of ABs is important in the AB policy, there are also several deliverers of ABs in NHs (Table 15).

Table 15: Deliverers of ABs in NHs

Country	Public pharmacy	Hospital pharmacy	Wholesaler	Supplied by family	Other
Belgium	++	+		+	
Croatia	++				
Czech Rep.	++				
Denmark	++	-	-	-	-
Finland	-	+	-	-	
France	++	+	-	-	-
Germany	++	-	+	+	
Hungary	++			+	
Ireland	++	+	-	-	
Italy	++	++	-	+	
Latvia	+	-	++	+	
Malta	+				++
Netherlands	++	++		-	
Norway	++	+	+	-	-
Poland	++	+		-	
Russian Fed.			++	+	
Slovenia	++	+	-	-	-
Sweden	++	++	-	-	
UK					
England	++	+	-	-	-
N. Ireland	++	-	-	-	-
Scotland	++	-	-	-	
Total no	19	11	4	6	1
++: mostly	+: sometimes	-: never			

It is remarkable that in several countries NHs receive their ABs from hospital pharmacies, indicating links between hospitals and NHs or that NH residents with AB initiated using these at a time when they were admitted to a hospital.

Looking at both deliverers and prescribers of ABs some results can be linked. In half of the countries where internal medicine specialists prescribe ABs for NH residents the hospital pharmacy is (one of) the supplier(s) of ABs in the NH. It is expected that internal medicine specialists are working in, or in connection with, hospitals. A NH resident receiving a consultation from the specialist might also receive prescribed ABs from the hospital (pharmacy). This reasoning and the presence of an association can however not be supported by the survey data. Moreover, in contradiction with this reasoning, in four of the eleven countries where hospital pharmacies deliver ABs to NHs the internal medicine specialist is not one of the prescribers.

A specific category of ABs comprises enteral/parenteral ABs. In all countries it is necessary to have a prescription for all enterally/parenterally administered ABs in NHs. However, Malta and the Russian Federation indicate that it is possible that ABs requiring a prescription can be obtained without a prescription. In France, this happens exceptionally. In all other countries (no answer for the Netherlands) this is not possible.

In some countries it is common that national or regional guidelines are issued for appropriate AB prescription. Guidelines can exist at several levels; there can be guidelines written for the community or more specifically for NHs and hospitals. Table 16 shows, for the countries with guidelines for good practice with respect to AB prescription, several types of infections for which they exist and the level at which they were issued.

Table 16: Topics on which AB guidelines exist for NHs

Country	General AB use recommendations	Urinary tract infection	Pneumonia	Upper respiratory tract infection	Wound infection	Gastro-intestinal infection	Conjunctivitis
Belgium	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH
Croatia		C		C			
Finland		C	C	C			
France	C	H	C+ NH	C	C		
Germany	C	C	C	C			
Hungary		C	C	C			
Italy		C+ NH					
Netherlands	C+ H	NH	C+ H	H		H	
Norway	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH
Poland		C	C	C			
Russian Federation	C	C	C				
Slovenia	C+ NH		C+ NH		C+ NH		
Sweden	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH	C+ NH
UK							
England	C	C	C	C	C	C	C
N. Ireland	C	C	C	C	C	C	C
Total no (%)	10 (48%)	14 (67%)	13 (62%)	12 (57%)	7 (33%)	6 (29%)	5 (24%)

C: community NH: nursing home H: hospital

Only a small number of countries have guidelines specific for NHs. Guidelines are in some countries constituted at governmental level (Croatia, Poland and England), but in other countries guidelines are constructed by a wide variety of healthcare-related or scientific societies.

Also the year of first edition of the guidelines varies greatly between countries. France issued the first general recommendations in 1990. Other countries such as Croatia and Italy issued their guidelines more recently. More in depth information on the body that issued guidelines, the type of guidelines and the years of first edition and last revision for each country can be found in Appendix 4.

In none of the countries with guidelines the implementation into healthcare institutions is compulsory. For the sake of exchanging best guidelines supported by scientific research,

uniform European general guidelines might be recommendable, but these should be flexible enough to take into account specific antimicrobial resistance patterns in each country.

In Finland, France, Italy, Norway and the Russian Federation surveillance of AB use is available for NHs. In most of these countries this is organised at local level (either NH-level or regional). Only in Finland AB surveillance is continuous. In the remaining countries that perform surveillance this only takes place occasionally (no information available for Norway).

In Ireland, Italy and Norway annual AB consumption data by AB category are available for NHs. In (some NHs in) Ireland and Italy these data are available at local level (no answer given by Norway). In Sweden some information is available for research purposes but not necessarily for surveillance objectives at NH level.

In Belgium, Norway and the Russian Federation there are therapeutic formularies from an official or scientific organisation specific for NHs available with a chapter on AB therapy. Sweden mentions that there is no official therapeutic formulary for NHs but that there are guidelines to optimise AB use for specific infections that apply to any kind of healthcare institution (see Table 16).

Only in Italy there is a national list available with restrictions for ABs that can be prescribed in NHs.

An AB/antimicrobial committee is composed of doctors prescribing ABs and a pharmacist, and in some cases a CP, infection control practitioner (ICP) and microbiologist. The committee is in charge of developing local guidelines and protocols for AB use in the NH. In none of the participating countries there are official AB committees installed in NHs.

It is possible to have a registration system of the prescription behaviour of medical doctors which includes individual AB prescription profiles. Prescription profiles allow benchmarking between prescribers and can also show deviant prescription behaviour. In Belgium, Poland, Slovenia and the UK (England, Northern Ireland and Scotland) prescription profiles are available. Sweden mentions that there is no national or regional system on prescription profiles but that profiles are investigated on local level if this is desired.

To optimise and follow-up on AB prescription behaviour several measures can be thought of on national or on smaller level. In Finland and Slovenia there is regular (at least once per year) training on appropriate AB use given to prescribers of ABs in NHs. Belgium, Finland, Norway and Slovenia have stimulated, in the past five years, microbiological documentation for guidance of the best AB selection in NHs. In Slovenia and Sweden there is a data collection system in use, since five years or less, on drug resistance profiles in NHs. In Sweden this data is only collected when desired and only at local level. Finally, in Norway and Slovenia initiatives were taken during the last five years to promote using advice from pharmacists on appropriate AB use in NHs. Slovenia is the single country where all of the four selected initiatives were taken.

A final category of AB policy in NHs comprises the cost of ABs. The cost of ABs can be entirely or only partially for the account of the NH resident. It is possible that the costs for ABs are not paid by residents but by, for example, health insurance or other payment systems (at national or NH level). Malta remarkably indicated both that costs are entirely covered by the NH residents and that ABs are free of charge. In Czech Republic, Croatia, Finland, France, Ireland, the Netherlands, Norway, the Russian Federation, Slovenia and the UK (England, Northern Ireland, Scotland) ABs are free of charge for NH residents. In Italy only ABs that are included in the national formulary are free of charge for NH residents. In Latvia no costs are charged for ABs prescribed in hospitals and in NHs. In the remaining participating countries costs of ABs are partially paid by the NH resident.

3.5 - Infection control practice in nursing homes

To optimise AB use, the prevention of infections and the prevention of AB resistance are of vital importance. A number of interventions and measures can be executed by NHs. An ICP can be appointed, either a nurse or a doctor, to carry out specific infection control related tasks in the NH. The question whether the presence of an ICP was compulsory for NHs was only answered affirmatively by the Russian Federation. Both a nurse and a doctor could carry out the job of an ICP.

As described in Table 11, a CP was appointed as responsible for developing the infection control policy in four countries, Belgium, Czech Republic, France and the Russian Federation. Only the Russian Federation has made the presence of an ICP compulsory to carry out this policy. Furthermore, Table 14 indicates that in Finland the ICP can prescribe ABs although it was registered that there is no ICP present in Finnish NHs. Possibly a hospital ICP can prescribe ABs to a NH resident.

NHs in some countries have ICPs even though this is not compulsory by law. In Ireland, the Russian Federation and Slovenia NHs make use of medical doctors as ICP. The medical specialty of this infection control doctor is microbiology in Ireland. In Slovenia the ICP is a GP. In the Russian Federation the specialty of the infection control doctor is different from the given categories, though not specified. In the Netherlands, Northern Ireland, and Norway the ICP is a nurse. Ireland, the Russian Federation and Slovenia have nurse ICPs next to doctors as ICP. In all of these countries, except for Slovenia, the nurses have an infection prevention specialisation as background. In the Netherlands the infection control nurse has a specialty in hospital hygiene next to a specialty in infection prevention.

The countries who appoint ICPs in their NHs indicated the tasks that ICPs perform. For Russia these include legally imposed tasks, since the presence of an ICP in NHs is compulsory. Four other countries also indicated tasks for ICPs (Table 17).

Table 17: Infection prevention tasks of ICPs in NHs

Tasks	Countries				
	Ireland	Northern Ireland	Norway	Russian Fed.	Slovenia
Surveillance (registration and follow-up) of infections in the NH	+	+	+	+	
Infection prevention training of nursing and paramedical staff	+		+	+	+
Infection prevention training of GPs and medical staff			+	+	+
Development of care protocols	+	+	+		+
Registration of NH residents colonised or infected with multi-resistant micro-organisms	+		+	+	+
Investigation of outbreaks	+	+	+		+
Feedback on surveillance results to nursing/medical staff	+	+	+		
Formulation of recommendations/ advice for good AB use. Development of NH AB policy			+		
Supervision of disinfection and sterilisation of medical and care materials		+	+	+	+
Deciding on isolation and precautions for residents colonised with multi-resistant micro-organisms	+	+	+		+
Supervision and development of vaccination policy in the NH		+	+	+	+
Feedback to GPs on AB consumption in the NH			+		
Organisation of, control of and feedback on hand hygiene in the NH	+	+	+	+	+

When comparing the tasks of a CP (Table 11) to the tasks of an ICP, there is quite some overlap in the categories of tasks, i.e. for training and development of care protocols, AB policy, infection control measures, vaccination policy and meeting with GPs. It is possible that the ICP is responsible for the development of infection control specific measures within the CP's tasks.

An infection control committee is a multidisciplinary committee involved in the prevention and control of healthcare-acquired infections, often composed of all or some of the following professionals: physicians, nursing staff, ICPs, quality assurance personnel, risk management personnel, representatives of microbiology, surgery, central sterilisation, pharmacy, environmental services, etcetera.

Croatia, Czech Republic, Denmark, France, Germany, Hungary, Ireland, Italy, Latvia, Malta, the Netherlands, Norway, Poland, the Russian Federation, Scotland and Slovenia (no information available for Sweden) registered that there is an infection control committee in some NHs. In none of these countries an infection control committee in NHs is compulsory (lacking answer for France, Italy, the Russian Federation and Slovenia). An exact overview cannot be verified because of possible misinterpretation (because of lack of an option to answer negatively to this question). Lastly, it is possible that NHs and hospital infection control teams collaborate on the topic of infection prevention. Only in

Finland and Norway this partnership between NH and hospital is regulated by law (no information available for Croatia and Sweden).

3.6 - Comparison of results of the national survey to results of the first point prevalence survey

This national survey preceded the point prevalence survey (PPS) of April 2009 in order to construct an image of the European NH context. Participants of the PPS were individual NHs, answering questions specifically for that NH and for the NH's residents. From the institutional questionnaire a number of questions were alike or comparable to questions from the NS. It seemed interesting to complete the above summarised results with information obtained directly from the ESAC NHs participating to the PPS. In this paragraph results from the PPS are analysed at country level and are compared to results from this NS. It should however be noticed that results are not representative for the country level since only few NHs participated in the PPS for several of the countries. Tables 18a, 18b and 18c show some of the (crude) results from the PPS and the discrepancies with the NS.

Characteristics of NHs and organisation of care

Comparison regarding the mean NH size, mean occupation rate and ownership are depicted in table 2 and 18a. For almost all countries the mean NH size was larger in the PPS than in the survey.

Some dissimilarities were seen with regard to medical care providers (Table 9 and 18a) and the presence of a CP (Table 10 and 18b). When CPs were present in all NHs according to the PPS in comparison to some NHs in the NS this was not regarded as a discrepancy. The specialty of CPs was hard to compare (Table 10 and 18b); either answers were absent in the NS or information was lacking in the PPS. In general, no obvious discrepancies were found, looking at the most indicated specialty. The tasks for the CP differed widely (compared to Table 11). Both the number of countries registering tasks for the CP as the registered tasks were different in the PPS and the NS. NHs from Belgium, Czech Republic, France and the Netherlands registered in the PPS that the CP performs all cited tasks, while this was not the case in the NS. In the Russian Federation this was the other way around. NHs in Sweden only registered three tasks for the CP of which two resembled the tasks from the NS. In Latvia and Norway no CP tasks were registered in the PPS.

The time spent by the CP per resident per year was indicated by only four countries. For Belgium, Finland, France and Slovenia the actual time spent on co-ordination tasks per resident, according to the PPS, is lower than indicated in the NS.

With respect to the availability of certified nurses and medical doctors when available in almost all NHs in the PPS and in some NHs in the NS this was not regarded as a discrepancy (Table 13 compared to Table 18b and 18c).

A few dissimilarities occurred with regard to the physician prescribing ABs (Table 14 and 18b) and the deliverers of ABs (Table 15 and 18c), however results were not completely comparable since different categories were used.

Antibiotic policy

A number of topics on AB policy of the NS were combined in the PPS. In Czech Republic and Ireland results from the PPS showed that some NHs had guidelines for appropriate AB use while the NS indicated that these did not exist in NHs. For Germany and Northern Ireland however, the opposite was true (compared to Table 16). There were also some inconsistencies seen regarding the type of guidelines, however there were different categories of guidelines in the PPS and the NS. In Czech Republic, Finland, Ireland, Italy, the Netherlands, Poland, the Russian Federation and Slovenia NHs had AB guidelines available for more types of infections than was indicated in the NS. While the opposite was true for Germany, Northern Ireland and Sweden.

At least some of the NHs in Czech Republic, France, the Netherlands, Poland, Slovenia and Sweden had annual AB consumption data available, even though in the NS this did not appear to be the case. In Ireland none of the participating NHs had annual AB consumption data available, while there should be a continuous system of AB consumption data collection according to the NS.

In the Russian Federation the availability of a NH specific therapeutic formulary, including AB therapy, is compulsory, however not all NHs had this formulary available. Czech Republic, Ireland, Italy, the Netherlands and Slovenia all indicated in the NS not having this formulary, while in the PPS at least some NHs did have a NH specific formulary.

All of the countries, in the sample of participating NHs, indicating presence of a restrictive list on ABs in some NHs in the PPS, had indicated that such a list was not present in the NS.

In at least some NHs in Czech Republic, France, Italy, the Netherlands and Sweden there were AB committees as indicated in the PPS even though the NS showed the opposite.

Lastly, for many countries there were differences between the measures taken in the AB policy (training of prescribers, microbiological sampling, drug resistance profiles and advice from a pharmacist). In Croatia, Czech Republic, Denmark, England, France, Germany, Ireland, Italy, the Netherlands, Northern Ireland, Poland and the Russian Federation at least one measure is taken in at least some NHs based on the results from the PPS. These countries registered that there were none of these measures in NHs in the NS. In Belgium, Finland and Sweden there were more measures registered in the PPS than in the NS.

Infection control practices

In Belgium, Czech Republic, Denmark, England, Finland, France, Germany, Ireland, Italy, Slovenia and Sweden at least in some NHs an ICP was present according to the PPS while this was not the case in the NS. An explanation for the difference can be that the NS asked compulsory presence and the PPS simply presence. In the Russian Federation only some NHs in the PPS had an ICP even though according to the NS the presence of an ICP was compulsory.

Eleven countries specified which care provider performs the tasks of an ICP in the PPS, while only six of them did so in the NS. Three of these six countries (the Netherlands, Northern Ireland and Norway) did not answer the question on the type of ICP in the PPS. For the Russian Federation and Slovenia the answers in the PPS and in the NS matched. For Ireland the NS showed that both doctors and nurses could be an ICP, however in the participating NHs in the PPS only doctors were active as ICP.

Five countries participating in the PPS registered the tasks of an ICP in the NS (see Table 17). For Ireland and Slovenia almost all tasks were comparable, except for some additional tasks in the PPS. In Northern Ireland and the Russian Federation only one NH indicated the tasks of the ICP which were not completely comparable to the NS. NHs in Norway could not be compared because of lacking answers in the PPS.

With respect to the presence of an infection control committee in more than half of the countries the answers matched between the PPS and the NS. NHs in Belgium, Denmark and Northern Ireland registered in the PPS having infection control committees in some NHs as opposed to answering no presence in the NS. In Malta and the Netherlands all in the PPS participating NHs had such a committee, which was more than indicated in the NS. The participating NHs in Croatia, Latvia and Poland did not have such a committee even though it was indicated that some NHs had an infection control committee in the NS. An official connection with a hospital infection control team was present in more countries than expected from the NS. In Belgium, Czech Republic, France, Germany, Ireland, Italy, Malta, the Netherlands, Northern Ireland, the Russian Federation and Slovenia at least some NHs had a link with infection control teams in hospitals.

It is important to note that the NS, giving a global image, does not take into account local initiatives which are likely to be present.

Table 18a: Discrepancies and similarities PPS and NS

Country	Mean amount of beds per NH	Discrepancy	Mean occupation rate (%)	Discrepancy	Ownership (public, private, both)	Discrepancy	Medical care provider? ^a (GP, NH doctor, both)	Discrepancy
Belgium	108	+9	97%		Both		GP, both, NH doctor	X
Croatia	262	+132	98%		Public	X	GP	
Czech Rep.	126	+66	89%		Both	X	NH doctor	
Denmark	68	+32	96%		Public	X	GP	X
England	52	+12	90%		Private	X	GP	
Finland	219	+177	99%		Public	X	NH doctor, GP, both	
France	82	+8	88%	-7	Both		GP, both, NH doctor	X
Germany	84	+11	95%	+6	Both		GP, NH doctor	
Ireland	100	+17	94%		Public	X	NH doctor, GP, both	X
Italy	97	+28	96%	+6	Both		NH doctor, both, GP	
Latvia	245	+156	98%		Public	X	GP, both	X
Malta	66		97%		Public		Both	
Netherlands	184	-4	98%		Public	X	NH doctor	
Northern Ireland	49	+8	92%	-3	Private		GP	
Norway	115	+75	99%		Both		NH doctor	X
Poland	142	+68	97%	-3	Public	X	GP, both, NH doctor	
Russian Fed.	469	+119	94%	-6	Both	X	Both	
Slovenia	240	+44	100%		Both		GP	
Sweden	60	+26	94%	-5	Both		NH doctor, both	X

^a Ordered from most to least present.

Table 18b: Discrepancies and similarities PPS and NS

Country	CP present in all NHs?	Discrepancy	CP specialty ^a	Discrepancy	Certified nurse present 24h in all or not all NHs	Discrepancy	Prescriber of ABs ^a	Discrepancy
Belgium	Yes, in most	X	GP, geriatrics, other		Not all	X	GP, geriatrician, specialist, other	
Croatia	Yes, in some	X	GP	?	All	X	GP, internal, other	
Czech Republic	Yes		Internal, geriatrics, other, GP		All		Internal, geriatrician, infection specialist	X
Denmark	No		n.a., GP	?	Not all		GP, other, internal	
England	Yes	X	GP	?	All		GP, other, geriatrician	
Finland	Yes, in most		Geriatrics, GP	?	All		Geriatrician, GP	
France	Yes		Geriatrics, GP, other		Not all		GP, geriatrician, other, internal	X
Germany	No, in most		n.a., GP	?	All	X	GP, other	
Ireland	Yes, in some		GP, geriatrics, other	?	All		GP, other, geriatrician, internal	
Italy	Yes, in some		Other, geriatrics, GP	?	All		GP, geriatrician, other, internal	
Latvia	No	X	n.a.	?	Not all	X	GP, other	
Malta	No		n.a.	?	Not all		GP, geriatrician, internal	
Netherlands	Yes		Other		All		GP, other	
Northern Ireland	No		n.a.	?	All		GP	
Norway	Yes		n.a.	?	All		n.a.	?
Poland	Yes	X	Internal, GP, geriatrics, other	?	Not all	X	Internal, GP, other, geriatrician	
Russian Federation	Yes		Other, GP, internal, geriatrics	?	All		Internal, other, geriatrician	
Slovenia	Yes, in some	X	GP	?	All		GP, other, infection specialist, internal	X
Sweden	No, in most		Geriatrics, GP, other		Not all		GP, geriatrician, other	

n.a.: Not available, no data registered

^a Ordered from most to least present.

Table 18c: Discrepancies and similarities PPS and NS

Country	Medical doctor available/reachable. In all or some NHs?						Deliverer of ABs ^a	Discrepancy	
	Reachable during the day.	Discrepancy	Present during the day.	Discrepancy	Reachable during the night. (In all or some NHs?)	Discrepancy			Present during the night. (In all or some NHs?)	Discrepancy
Belgium	(almost) All		Some	X	(almost) All		Some	X	Public ph., family, hospital ph., wholesaler
Croatia	All	?	All	X	No		No		Public ph.
Czech Republic	No	?	All		Some	?	All		Hospital ph., public ph.
Denmark	All		No		All		No		Public ph., family
England	All		No		All		No		Public ph.
Finland	All		All	X	(almost) All	X	No		Hospital ph., public ph.
France	(almost) All		Some	X	Some	X	No		Public ph., hospital ph., other
Germany	All		Some		All		No		Public ph., hospital ph.
Ireland	All		Some		All		Some		Hospital ph., public ph., wholesaler, family
Italy	Some	X	(almost) All		Some	X	Some	?	Hospital ph., public ph., family, wholesaler
Latvia	(almost) All		All	X	All	X	No		Wholesaler
Malta	All		No		All	?	No		Public ph., hospital ph., other, family
Netherlands	n.a.	?	All		All		No		Hospital ph., public ph.
Northern Ireland	All		No		All		No		Public ph.
Norway	All		All	X	No	X	No		Wholesaler, hospital ph.
Poland	All	X	Some		All	X	Some	X	Public ph., family, hospital ph., wholesaler
Russian Federation	All	?	All		All		Some		Wholesaler, public ph., family, hospital ph.
Slovenia	All		(almost) All	?	All	?	No	?	Public ph., other
Sweden	All		Some		(almost) All		No		Hospital ph., public ph., family

n.a.: Not available, no data registered

^a Ordered from most to least present.

4 - DISCUSSION AND CONCLUSIONS

4.1 - Comparison of European NHs

Large differences were found in investigating characteristics of NH care, its population, the systems for medical- and nursing care, AB policies, infection control measures, etcetera. No two countries were more or less alike in offering NH care. Also no straightforward parallels could be drawn between NHs in countries in the same geographical region, e.g. Western Europe versus Eastern Europe. A few of the points that were to some extent comparable in all countries were that NHs in many countries are subordinated to norms (although not the same norms in all countries), that in most countries a wide variety (or all cited) of types of care is offered and the organisation of nursing care is relatively identical.

Because of diverging answers within one country it is likely that even within a country (large) differences exist between NHs. National representatives were able to give a general description of NHs in their country but it is expected that even the NRs do not have a profound and detailed knowledge and view on the characteristics and system of every single NH in the country.

All of the differences found should be taken into account when constructing and analysing the PPS to be performed following the NS. For instance, it might be interesting to see if in NHs an AB and/or infection control policy is applied.

4.2 - Limitations and advantages of the study and future opportunities

A weakness of this NS was that only a very broad and rough view is gained of the way NHs operate in different countries. The assessment of one person or of a small group of experts might not be completely corresponding to reality. Moreover, an accurate comparison is not possible because of this. An attempt was made to verify some of the answers by means of browsing the internet and by literature searches but it was impossible to verify all answers amongst others because of linguistic restrictions. Another weakness of this study is that questions could only query about characteristics of NHs in a categorised manner. Specific situations for countries or NHs could not be discovered by means of this survey. At the same time this is also an advantage of this type of study. By using categorised and broad questions it is possible to somewhat compare probably very diverge NH systems. If every country or every NH had the opportunity to fill in open questions this would generate a large pool of specific and different answers even though most likely some of these answers would be the same if interpreted or written slightly differently. Therefore categorisation of answers is necessary and at least gives some opportunity for analysis. This NS formed a good basis for the PPSs that followed in order to construct the right questions and to get an image of European NHs prior to the PPS. Furthermore, misinterpretation of some questions and misinterpretation of answers, also due to ambiguous answers, might have occurred. Concepts can be interpreted differently, influenced by cultural and linguistic differences.

By means of the NS it was impossible to detect local initiatives with respect to the organisation of NH care. By means of the PPS exceptions on general national NH care and local efforts will be known. This can explain the difference between the results from the NS and the PPS.

In the future it might be interesting to perform a comparable NS again, i.e. after five or ten years. Because of increasing threats of (new) infectious diseases, increasing AB resistance, the ageing European population, changing political systems (changed governments, more emphasis on European collaboration), NH care might be subject to changes. By adapting some questions, because of variables or answer options that appeared not to be relevant, new variables or answer options that proved to be relevant

an improved survey can be constructed that is at the same time (partly) comparable to the previous results.

Another possibility for the future is that countries or NHs learn from each other through the survey results. Information on interesting measures might be exchanged between countries when comparable situations occur.

4.3 - Conclusions

An important result is that a global image was obtained by means of this qualitative study. The first, and most important, conclusion from this survey is that NH systems in European countries are widely differing. The way the NH system works is per country strongly interwoven with cultural aspects, culture being determined by political policies, views on NH care (of residents, possible eligible residents, elderly, their family members and the whole society), and possibly by available resources.

Straightforward conclusions on certain aspects of NH care can not be drawn as a result of the wide divergence. Overall, in many NHs the role of AB- and infection prevention policy is still (relatively) small.

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APPENDIX 1: NATIONAL SURVEY QUESTIONNAIRE

1. Characteristics of high skilled nursing homes and NH residents	
1.1	How many NHs exist in your country? ... (facilities/ country)
1.2	How many beds are available in your country? ... (beds)
1.3	What is the mean size of these NHs? (only if 1.1 and/or 1.2 are unknown) ... (beds/ NH) <input type="checkbox"/> Exact <input type="checkbox"/> Estimate
1.4	What is the mean occupation rate in these NHs? ... (%) <input type="checkbox"/> Exact <input type="checkbox"/> Estimate
1.5	What is the mean length of stay in these NHs? ... (months) <input type="checkbox"/> Exact <input type="checkbox"/> Estimate
1.6	Do these NHs belong to the: <input type="checkbox"/> Private sector (all) <input type="checkbox"/> Public sector (all) <input type="checkbox"/> Both (some are private, others public) <input type="checkbox"/> Other? Specify.....
1.7	Are these NHs: Officially registered (national, regional, local register?) <input type="checkbox"/> No <input type="checkbox"/> Yes Where? Officially recognized? (procedure of official recognition?) <input type="checkbox"/> No <input type="checkbox"/> Yes Under which authority?
	Regulated by law, decree, etc. <input type="checkbox"/> No <input type="checkbox"/> Yes
	Subordinated to comply with norms <input type="checkbox"/> No <input type="checkbox"/> Yes
	Receiving inspection/control visits. <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, who controls these NHs?
1.8	If the NHs have to fulfil norms, are these norms: <input type="checkbox"/> National <input type="checkbox"/> Regional <input type="checkbox"/> Local <input type="checkbox"/> Others
1.9	To which of the following do these norms pertain: <input type="checkbox"/> Planning of beds <input type="checkbox"/> Architectonic requirements <input type="checkbox"/> Minimum required nursing staff <input type="checkbox"/> Organisation of nursing care <input type="checkbox"/> Organisation of medical care <input type="checkbox"/> Quality of care <input type="checkbox"/> Safety
1.10	What kind of care is offered to the residents in these NHs? <input type="checkbox"/> Palliative care <input type="checkbox"/> Specialised medical care <input type="checkbox"/> High skilled nursing (global care: ADL+ high tech nursing) <input type="checkbox"/> Basic care and Activity of Daily Living assistance <input type="checkbox"/> Hotel service (residential, shelter) <input type="checkbox"/> Revalidation <input type="checkbox"/> Convalescence

1.10	<input type="checkbox"/> All of these types in all wards (mixed) <input type="checkbox"/> All of these types in separate wards (specialised wards)	Disabled	<input type="checkbox"/> only	<input type="checkbox"/> and
1.11	<p>In general, are these NHs considered as</p> <input type="checkbox"/> Acute wards (transfer unit, short stay) <input type="checkbox"/> Sub-acute (transfer unit, medium stay) <input type="checkbox"/> Chronic (transfer unit, long stay) <input type="checkbox"/> Definitive (no transfer unit) <input type="checkbox"/> Terminal – palliative care institution (end of life care) <input type="checkbox"/> Mixed (all or some of the preceding types are possible within the same facility)	Handicapped	<input type="checkbox"/> only	<input type="checkbox"/> and
1.12	<p>Are there waiting lists for admission to these NHs?</p> <input type="checkbox"/> No <input type="checkbox"/> Yes, in all NHs <input type="checkbox"/> Yes, in some NHs	Dementia	<input type="checkbox"/> only	<input type="checkbox"/> and
1.13	<p>Are there minimal requirements and exclusion criteria for admission to these NHs?</p> <input type="checkbox"/> No <input type="checkbox"/> Yes, in all NHs <input type="checkbox"/> Yes, in some NHs <p>If so, what kind of requirements and restrictions?</p> <input type="checkbox"/> Age exclusion criteria: <input type="checkbox"/> Physical condition exclusion criteria: <input type="checkbox"/> Mental condition exclusion criteria: <input type="checkbox"/> Infectious condition exclusion criteria: <input type="checkbox"/> Other? Specify:	Old age	<input type="checkbox"/> only	<input type="checkbox"/> and
1.14	<p>What is the mean age of the residents in the NHs? ... (years)</p> <input type="checkbox"/> Exact <input type="checkbox"/> Estimate	All of these	<input type="checkbox"/>	
1.15	<p>For what kind of health problems can residents be admitted to these NHs?</p> Physical <input type="checkbox"/> only <input type="checkbox"/> and Mental <input type="checkbox"/> only <input type="checkbox"/> and Psychiatric <input type="checkbox"/> only <input type="checkbox"/> and Mixed <input type="checkbox"/> only <input type="checkbox"/> and	<p>1.16 Is the use of specific scales or scores compulsory in these NHs in order to evaluate:</p> <p>Care load <input type="checkbox"/> No <input type="checkbox"/> yes, in all NHs <input type="checkbox"/> yes, in some NHs If yes, specify</p> <p>Dependency degree <input type="checkbox"/> No <input type="checkbox"/> yes, in all NHs <input type="checkbox"/> yes, in some NHs If yes, specify</p> <p>Risk (bed sores, infection, nutrition, ...) <input type="checkbox"/> No <input type="checkbox"/> yes, in all NHs <input type="checkbox"/> yes, in some NHs If yes, specify</p> <p>Mental status <input type="checkbox"/> No <input type="checkbox"/> yes, in all NHs <input type="checkbox"/> yes, in some NHs If yes, specify</p>		
2. Organisation of medical and nursing care in high skilled NHs				
2.1	<p>How is medical care organised in the NHs in your country? Is medical care for residents provided by the:</p> <input type="checkbox"/> Personal general practitioner (GP) only: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Medical staff employed by the NH only: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Both: GP and medical doctors employed by the NH: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Other. Specify			
2.2	<p>Are medical activities co-ordinated by a co-ordinating medical doctor/physician (CP) in the NHs?</p> <input type="checkbox"/> No, no co-ordination of the medical activity in the NHs <input type="checkbox"/> Yes, in all NHs <input type="checkbox"/> Yes, in some NHs			

<p>2.2 If yes, is the presence of a co-ordinating medical doctor in NHs compulsory in your country? (e.g. by law)</p> <p><input type="checkbox"/> No, not compulsory</p> <p><input type="checkbox"/> Yes, compulsory in all NHs over the country</p> <p><input type="checkbox"/> Yes, compulsory but only in some regions</p>	<p><input type="checkbox"/> Co-ordinating resident vaccination policy in the NH</p> <p><input type="checkbox"/> Organising meetings with the GPs in order to harmonise medical care practices/ policies</p> <p><input type="checkbox"/> Peer review of medical activities in the NH</p> <p><input type="checkbox"/> Other, specify</p>
<p>If compulsory, since when (year)?</p>	<p>2.3 Is the minimum time to spend on medical co-ordination by the co-ordinating physician in the NH determined in a legal or official text? <input type="checkbox"/> No <input type="checkbox"/> Yes</p>
<p>If compulsory, are there requirements about the medical specialty of this designated physician?</p> <p><input type="checkbox"/> No, no specific medical specialty required <input type="checkbox"/> Yes</p>	<p>2.4 If data are available, on average how many hours/ resident/ year has to be spent to medical co-ordination by the co-ordinating physician(s) in the NHs? Mean number of hours of medical co-ordination/ resident/ year ...</p>
<p>If compulsory, what kind of medical specialty I required for the designated co-ordinating physician?</p> <p><input type="checkbox"/> General practice</p> <p><input type="checkbox"/> Internal medicine</p> <p><input type="checkbox"/> Geriatrics – gerontology</p> <p><input type="checkbox"/> Other. Specify</p>	<p>2.5 For medical care to residents, is a medical doctor:</p> <p>Reachable (phone) during the day</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p> <p>Reachable at night</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p> <p>Physically present (in the NH) during the day</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p> <p>Physically present at night</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p>
<p>Is the co-ordinating task of this co-ordinating physician described (e.g. by law, decree, etc.)?</p> <p><input type="checkbox"/> No, no description of co-ordinating tasks available <input type="checkbox"/> Yes</p>	<p>2.6 For nursing care needs of the residents, is a certified (qualified) nurse:</p> <p>Reachable (phone) during the day</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p> <p>Reachable at night</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p> <p>Physically present (in the NH) during the day</p> <p><input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p>
<p>If a task description is available, which of the following tasks is the co-ordinating physician in charge of?</p> <p><input type="checkbox"/> Medical resident care</p> <p><input type="checkbox"/> Organising the medical on-call service in the NH (continuity of medical care)</p> <p><input type="checkbox"/> Supervising the medical records of all residents (even for residents treated by other GPs)</p> <p><input type="checkbox"/> Training of medical doctors in the NH</p> <p><input type="checkbox"/> Training of nursing staff in the NH</p> <p><input type="checkbox"/> Development of an antibiotic policy in the NH</p> <p><input type="checkbox"/> Development of care strategies in the NH</p> <p><input type="checkbox"/> Development of infection prevention policy in the NH</p>	

<p>2.6 Physically present at night <input type="checkbox"/> No <input type="checkbox"/> yes, in all the NHS <input type="checkbox"/> yes, in some NHs</p>	<p>3.2 In general, which of the following persons prescribe antibiotics in the NHs? General practitioners <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Medical doctors employed by the NH <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Co-ordinating physicians <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Infection control practitioners <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Internal medicine specialists <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Pharmacists <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Nurses <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Others, specify <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never</p>
<p>2.7 How is the nursing care organised in the NHs in your country? Is nursing care to residents provided by: <input type="checkbox"/> Certified nurses visiting the NH (home care) only: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Certified nurses employed by the NH only: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Both: certified home care nurses and employed certified nurses by the NH: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Not certified home care- or employed nurses: <input type="checkbox"/> only in some NHs <input type="checkbox"/> in all NHs <input type="checkbox"/> Other. Specify</p>	<p>3.3 Can antibiotics that require prescription in your country be obtained without? <input type="checkbox"/> No <input type="checkbox"/> Yes</p>
<p>2.8 Are nursing activities in the NHs co-ordinated by a head-nurse or person responsible for nursing? <input type="checkbox"/> No, no co-ordination of the nursing activity is available <input type="checkbox"/> Yes, in all NHs <input type="checkbox"/> Yes, in some NHs</p> <p>If yes, is the presence of a nursing responsible and/or a head nursing in NHs compulsory in your country? (e.g. by law) <input type="checkbox"/> No, not compulsory <input type="checkbox"/> Yes, compulsory in all NHs over the country <input type="checkbox"/> Yes, compulsory but only in some regions</p>	<p>3.4 In general, who delivers antibiotics to NH residents?: Public pharmacy <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Hospital pharmacy <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Wholesaler <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Supplied by the family <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never Other, specify <input type="checkbox"/> mostly <input type="checkbox"/> sometimes <input type="checkbox"/> never</p>
<p>3. Antibiotic policy in the NHs</p>	
<p>3.1 Does enteral/parenteral antibiotics require prescription in your country? <input type="checkbox"/> No prescription needed for enteral/parenteral AB <input type="checkbox"/> Yes, prescription needed for all enteral/parenteral AB <input type="checkbox"/> Yes, prescription needed, for some enteral/parenteral AB</p>	<p>3.5 For which of the following infections are national or regional written guidelines for appropriate AB prescription (good practice) in NH and/or in the community available? Who developed these guidelines? Year of first version and year of last update? Intended for the community only (C), for the NH only (NH) or for both (C/NH)?</p>

3.5	Type of infection	Developed by	Year 1st version	Year last update	Community (C) or Nursing home (NH)
	<input type="checkbox"/> Urinary tract	.....	...	...	.....
	<input type="checkbox"/> Pneumonia	.....	...	...	.....
	<input type="checkbox"/> Upper respiratory tract	.....	...	...	.....
	<input type="checkbox"/> Wound	.....	...	...	.....
	<input type="checkbox"/> Gastro-intestinal	.....	...	...	.....
	<input type="checkbox"/> Conjunctivitis	.....	...	...	.....
	<input type="checkbox"/> General	.....	...	...	.....
	recommendations on AB use				
	Is the implementation of these guidelines by the NH compulsory? <input type="checkbox"/> No <input type="checkbox"/> Yes				
	If yes, since when (year)? ...				
3.6	Is surveillance of AB use organised in the NHs?				
	<input type="checkbox"/> No <input type="checkbox"/> Yes				
	If organised at which level?				
	<input type="checkbox"/> National level <input type="checkbox"/> Regional level <input type="checkbox"/> Local level				
	<input type="checkbox"/> Other, specify				
	If organised, is the surveillance:				
	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent, every <input type="checkbox"/> Occasional				
	If continuous, when did it start (year)? ...				
3.7	Are annual AB consumption data by AB category available for NHs?				
	<input type="checkbox"/> No annual data available				
	<input type="checkbox"/> Yes, annual continuous data since (year): ...				
	<input type="checkbox"/> Yes, not continuous, the most recent annual data from (year): ...				
	If available, at which level?				
	<input type="checkbox"/> National level <input type="checkbox"/> Regional level <input type="checkbox"/> Local level				
	<input type="checkbox"/> Other, specify				
3.8	Is a NH specific therapeutic formulary including a chapter on antimicrobial therapy proposed to NHs by an official or scientific organisation in the country?				
	<input type="checkbox"/> No <input type="checkbox"/> Yes				
	If proposed, is the use of this formulary in NHs compulsory?				
	<input type="checkbox"/> No <input type="checkbox"/> Yes				
	If compulsory, since when (year)? ...				
3.9	Is a national/regional restrictive list available for ABs that can be prescribed in NHs?				
	<input type="checkbox"/> No <input type="checkbox"/> Yes				
	If available, since when (year)? ...				
	If a restrictive list exists, what kinds of ABs are restricted and cannot be prescribed in NHs? Specify				
				
				
3.10	Are 'antibiotic committees' officially (national/regional) installed in NHs? <input type="checkbox"/> No <input type="checkbox"/> Yes				
	If installed, is the presence of these committees compulsory for NHs? <input type="checkbox"/> No <input type="checkbox"/> Yes				
	If compulsory, since when (year)? ...				
3.11	In your country, are 'prescription profiles by prescriber' officially (national/regional) available? <input type="checkbox"/> No <input type="checkbox"/> Yes				
	If installed, since when (year)? ...				

3.11	If available, do prescribers receive regular feedback on their own prescription habits (+benchmarking)? <input type="checkbox"/> No <input type="checkbox"/> Yes Are outliers in this profile system officially questioned about their prescription habits? <input type="checkbox"/> No <input type="checkbox"/> Yes
3.12	During the last five years, were national/regional/local initiatives taken for: 'Regular training of prescribers' on appropriate AB prescription (at least 1/ year) in NHs <input type="checkbox"/> No <input type="checkbox"/> Yes Stimulating 'microbiological sampling' for guidance of bet AB choice in NHs <input type="checkbox"/> No <input type="checkbox"/> Yes Installing a data collection system on 'drug resistance profiles' in the NHs <input type="checkbox"/> No <input type="checkbox"/> Yes Inviting 'pharmacists to provide advice' on AB prescription/ choice in the NHs <input type="checkbox"/> No <input type="checkbox"/> Yes
3.13	In your country, are the costs of antibiotics: <input type="checkbox"/> Entirely covered by the resident <input type="checkbox"/> Partially covered by the resident, % of total cost covered by the resident: ...% <input type="checkbox"/> Free of charge for the resident
<i>4. Infection control practice in the NH</i>	
4.1	In your country, is the presence of an infection control practitioner (ICP) in NHs compulsory? <input type="checkbox"/> No <input type="checkbox"/> Yes If compulsory, which ICP(s) is/are present in the NH? <input type="checkbox"/> Only a nurse <input type="checkbox"/> Only a doctor <input type="checkbox"/> A nurse or a doctor <input type="checkbox"/> Both, an 'infection control doctor' and an 'infection control nurse' are present If compulsory, How many full time equiv. (FTEQ) infection control doctors/

100 NH-beds are allocated in NHs? ... FTEQ/ 100 beds
How many FTEQ infection control nurses/ 100 NH-beds are allocated in NHs? ...FTEQ/ 100 beds
If an 'infection control doctor' is present in the NHs, what is most frequently his/her medical speciality? <input type="checkbox"/> Pharmacist <input type="checkbox"/> Microbiologist <input type="checkbox"/> Infection control doctor (hospital hygiene specialist) <input type="checkbox"/> Infectiologist <input type="checkbox"/> Epidemiologist <input type="checkbox"/> Other, specify
If an 'infection control nurse' is present in the NHs, what is most frequently his/her nursing speciality? <input type="checkbox"/> No specific infection prevention training <input type="checkbox"/> Specialisation in infection control <input type="checkbox"/> Hospital hygiene <input type="checkbox"/> Epidemiology <input type="checkbox"/> Other, specify
If present, which of the following tasks are the infection prevention experts legally in charge of? <input type="checkbox"/> Surveillance (registration and follow-up) of infections in the NH <input type="checkbox"/> Infection prevention training of nursing and paramedical staff <input type="checkbox"/> Infection prevention training of the GPs and medical staff <input type="checkbox"/> Developing care protocols <input type="checkbox"/> Registration of residents, colonised/infected with multi-resistant micro-organisms <input type="checkbox"/> Investigation of outbreaks

APPENDIX 2: REGISTRATION AND RECOGNITION OF NHS

Country	Officially registered *	Officially recognised *
Belgium	Yes, national by the NIHDI National Institute for Health and Disability Insurance (<i>RIVIZ-INAMI Rijksinstituut voor ziekte- en invaliditeitsverzekering – Institut national d'assurance maladie-invalidité</i>)	Yes, national and regional by the Federal and Regional Ministry
Croatia	Yes, national and local, n.a.	Yes, national by Ministry of Health and social welfare Republic of Croatia (<i>Ministarstvo zdravstva i socijalne skrbi Republike Hrvatske</i>)
Czech Republic	Yes, national by Ministry of Health (<i>Ministerstvo Zdravotnictvi České republiky</i>)	Yes, national by Ministry of Health (<i>Ministerstvo Zdravotnictvi České republiky</i>)
Denmark	Yes, n.a., n.a.	Yes, n.a., n.a.
Finland	Yes, national	Yes, n.a., Health protection office
France	Yes, local, department organization (<i>conseil général</i>)	Yes, local, department organization (<i>conseil général</i>)
Germany	Yes, national by Federal statistical office (<i>DESTATIS, Statistisches Bundesamt Deutschland</i>) and regional by federal states (<i>Bundesländer</i>)	Yes, regional by federal states (<i>Bundesländer</i>)
Hungary	N.a.	Yes, Health authority
Ireland	Yes, national by HSE Health Services Executive	No
Italy	Yes, national, n.a.	Yes, n.a., n.a.
Latvia	Yes, national by Ministry of Welfare, Social service administration (<i>Labklajibas ministra, sociālo pakalpojumu pārvalde</i>)	Yes, national by Ministry of Welfare, Social service administration (<i>Labklajibas ministra, sociālo pakalpojumu pārvalde</i>)
Malta	Yes, national, n.a.	Yes, national by Ministry for Social Policy
Netherlands	Yes, national by independent knowledge center (<i>Prismant</i>) and by Health Inspectorate (<i>IGZ Inspectie voor de gezondheidszorg</i>)	Yes, national by Health Inspectorate (<i>IGZ Inspectie voor de gezondheidszorg</i>)
Norway	Yes, local, n.a.	No
Poland	Yes, regional by department of a province government (<i>Urząd Wojewódzki</i>)	Yes, n.a., n.a.
Russian Federation	Yes, regional by the Department of Social Development of the Ministry of Health and Social Development	Yes, regional by the Department of Social Development of the Ministry of Health and Social Development
Slovenia	Yes, national by Ministry of Labour, Family and Social Affairs (<i>Ministrstvo za delo, družino in socialne zadeve</i>)	Yes, national by Ministry of Labour, Family and Social Affairs (<i>Ministrstvo za delo, družino in socialne zadeve</i>)
Sweden	Yes, regional by County administrative board (<i>Länsstyrelserna</i>)	Yes, regional by County administrative board (<i>Länsstyrelserna</i>)
UK		
England	Yes, national by the Care Quality Commission of the Ministry of Health (from April 2009)	No
N. Ireland	Yes, regional, n.a.	Yes, national by government
Scotland	Yes, national by Scottish Commission for Regulation of Care	N.a.

* all answers constructed as follows: Yes/No, and if yes, level and by which specific body (*official name in language of the country*)

n.a.: Not available, no data registered

APPENDIX 3: INSPECTION AND CONTROL ON NORMS IN NHS

Country	Inspection and control visits? If yes, by ...
Belgium	Yes, by Care and health agencies from regional ministries
Croatia	Yes, by the Sanitary Inspection (Health Inspectorate)
Czech Rep.	Yes, by the Ministry of Health
Denmark	Yes, by the Municipality and the National Board of Health
Finland	Yes, by the Health protection office
France	No
Germany	Yes, the federal states have local public health authorities for NHS
Hungary	No
Ireland	Yes, by the HSE Health Services Executive
Italy	Yes, n.a.
Latvia	Yes, by the Health Inspection, Food agency, Fire safety, etcetera
Malta	Yes, by Assessment and Rehabilitation Team
Netherlands	Yes, by the Health Inspectorate (<i>IGZ Inspectie voor de gezondheidszorg</i>)
Norway	Yes, by the Norwegian Board of Health Supervision
Poland	Yes, by department of a province government
Russian Federation	Yes, by the Department of Social Development of the Ministry of Health and Social Development, the Independent Association of Human Rights, the Department of Consumer Rights Surveillance and Protection (<i>Rospotrebnadzor</i>)
Slovenia	Yes, by Ministry (social inspection), Chambers (for social care and nursing care), Health Insurance Institute, Court of Audit, and many others
Sweden	Yes, by the County administrative board, municipalities, the National Board of Health and Welfare (<i>SoS Socialstyrelsen</i>) and The Pharmacy ^a (<i>Apoteket</i>)
UK	
England	Yes, by the Care Quality Commission of the Ministry of Health (from April 2009)
N. Ireland	Yes, by the Regulation and Quality Improvement Authority
Scotland	Yes, by the Scottish Commission for Regulation of Care

n.a.: Not available, no data registered

^a There are no private pharmacies in Sweden, a monopoly is held by the government

APPENDIX 4: GUIDELINES FOR APPROPRIATE AB PRESCRIPTION

General recommendations			Urinary tract infection	
Country	Developed by	Year first and last edition	Developed by	Year first and last edition
Belgium	Community+Hospital: BAPCOC Belgian Antibiotic Policy Co-ordination Committee, NH- (<i>RVT rust-en verzorgingstehuizen</i>) formulary	2006 - 2008 n.a.	BAPCOC, RVT-formulary	2006 - 2008 n.a.
Croatia			Working group Ministry of Health	2008
Finland			Duodecim Finnish Medical Society	2000 - 2006
France	SPILF French Infectious Diseases Society (<i>Société de Pathologie Infectieuse de Langue Française</i>)	2000 - 2000	SPILF, AFU French Urologic Society (<i>Association Française d'Urologie</i>)	1990 - 2002
Germany	PEG Paul-Ehrlich-Society (<i>Paul-Ehrlich-Gesellschaft</i>), German Drug Commission	1993 - 2004 2002 - 2006	PEG, German Drug Commission	2000 - 2006 2000 - 2006
Hungary			ID College	2003 - n.a.
Italy			ASSR Agency of Health and Social area (<i>Agenzia Sanitaria e Sociale Regione</i>) Emilia-Romagna	2008
Netherlands	SWAB Dutch Working Party on Antibiotic Policy (<i>Stichting Werkgroep Antibiotica Beleid</i>)	n.a. - n.a.	NVVA Dutch Association of NH physicians (<i>Nederlandse Vereniging van Verpleeghuisartsen</i>)	2006 - n.a.
Norway	National Expert Committee	1999 - 2008	National Expert Committee	1999 - 2008
Poland			(n.a.) National guidelines	n.a. - n.a.
Russian Federation	Collaboration: IAC Institute of Antimicrobial Chemotherapy, IACMAC Interregional Association for Clinical Microbiology and Antimicrobial Chemotherapy & Professional Scientific Societies	2003 - n.a.	Collaboration: IAC, IACMAC & Professional Scientific Societies	2000 - 2006
Slovenia	n.a.	2007 - n.a.		
Sweden	STRAMA Swedish Strategic Programme for the Rational Use of Antimicrobial Agents and Surveillance of Resistance (<i>Samverkan mot antibiotikaresistens</i>), SoS National Board of Health and Welfare and locally	Differs by county, Stockholm: 2008	STRAMA, SoS locally	Differs by county, Stockholm: 2008
UK				
England	Ministry of Health	2001 - 2008	Ministry of Health	2001 - 2008
N. Ireland	Four Regional Health Boards	Prior to 2000 - 2008	Four Regional Health Boards	Prior to 2000 - 2008

n.a.: Not available, no data registered

(continuation of table from Appendix 4)

Pneumonia			Upper respiratory tract infection	
Country	Developed by	Year first and last edition	Developed by	Year first and last edition
Belgium	BAPCOC, RVT-formulary	2006 - 2008 n.a.	BAPCOC, RVT-formulary	2006 - 2008 n.a.
Croatia			Working group Ministry of Health	2008
Finland	Duodecim Finnish Medical Society	2008	Duodecim Finnish Medical Society	n.a. - 2008
France	SPILF	1995 - 2006	SPILF	1996 - 1996
Germany	PEG	2000 - 2005	PEG	n.a. - 2005
Hungary	ID College	2005 - n.a.	ID College	2007 - n.a.
Netherlands	SWAB	1995 - 2005	SWAB	1998 - n.a.
Norway	National Expert Committee	1999 - 2008	National Expert Committee	1999 - 2008
Poland	(n.a.) National guidelines	n.a. - n.a.	(n.a.) National guidelines	n.a. - n.a.
Russian Federation	Collaboration: IAC, IACMAC & Professional Scientific Societies	1998 - 2006		
Slovenia	n.a.	2006 - n.a.		
Sweden	STRAMA, SoS locally	Differs by county, Stockholm: 2008	STRAMA, SoS locally	Differs by county, Stockholm: 2008
UK				
England	Ministry of Health	2001 - 2008	Ministry of Health	2001 - 2008
N. Ireland				
Wound infection			Gastrointestinal infection	
Country	Developed by	Year first and last edition	Developed by	Year first and last edition
Belgium	BAPCOC, RVT-formulary	2006 - 2008 n.a.	BAPCOC, RVT-formulary	2006 - 2008 n.a.
France	SPILF	2000 - 2000		
Netherlands			SWAB	2005 - n.a.
Norway	National Expert Committee	1999 - 2008	National Expert Committee	1999 - 2008
Slovenia	n.a.	2008		
Sweden	STRAMA, SoS locally	Differs by county, Stockholm: 2008	STRAMA, SoS locally	Differs by county, Stockholm: 2008
UK				
England	Ministry of Health	2001 - 2008	Ministry of Health	2001 - 2008
N. Ireland	Four Regional Health Boards	Prior to 2000 - 2008	Four Regional Health Boards	Prior to 2000 - 2008
Conjunctivitis				
Country	Developed by	Year first and last edition		
Belgium	BAPCOC, RVT-formulary	2006 - 2008 n.a.		
Norway	National Expert Committee	1999 - 2008		
Sweden	STRAMA, SoS locally	Differs by county, Stockholm: 2008		
UK				
England	Ministry of Health	2001 - 2008		
N. Ireland	Four Regional Health Boards	Prior to 2000 - 2008		

n.a.: Not available, no data registered

APPENDIX 5: RESULTS PER COUNTRY

Belgium

Belgium has the highest amount of NH beds available for the elderly. The mean size of NHs, mean LOS and mean age of residents are all above median value. Long stay care on all types of care is offered in mixed wards. Some of the NHs have waiting lists. Norms and (some) restrictions were applied in Belgium. With respect to age, persons under the age of 60 years are excluded for NH admission. Exclusion based on physical condition and mental condition is set by Katz scale values. The other type of exclusion criterium was very disturbing behaviour. The Katz scale is also applied for assessing the dependency degree. Evaluation of the mental status is executed by means of the Mini Mental State Examination (MMSE), but this evaluation is not compulsory. Medical care, supplied by personal GPs, is co-ordinated by regulated presence of a CP. The mean number of hours to be spent on co-ordination per resident per year is four hours. GPs are at all times reachable, while nurses (certified and uncertified) are at all times present. ABs are prescribed and delivered by varying parties. A large number of initiatives for policies on ABs in NHs have been taken (guidelines, annual consumption data, therapeutic formulary, continuous prescription profiles, microbiological sampling). There is no official surveillance organised but some NHs provide data at local level. The system of prescription profiles exists since 2006, though not continuous. Based on the prescription profiles, regular feedback is given to prescribers and care providers with deviant prescription behaviour are contacted. With respect to the costs of ABs, 15% and 25% of the costs are for the account of the NH resident. With respect to infection control, a comparison to Table 11 shows that the CP was appointed as responsible for the infection control policy. Furthermore, only few NHs have an AB committee.

Croatia

Croatia has one of the lowest accessibilities of NHs. Mean NH size and mean LOS are (high) above median value. All NHs have waiting lists. All types of care with mixed stays, although the high LOS probably indicated emphasis on long stay care, were offered in NHs in specialised units. Some norms and restrictions are applied to NHs. With respect to mental condition, certain psychiatric diagnoses are exclusion criteria. Only personal GPs and certified nurses offer care in all NHs. For co-ordination of care there are no CPs but there are nursing responsables present, which is compulsory. Doctors are physically present during daytime, but not available during the night. Nurses are (in some NHs) at all times reachable and present. GPs prescribe and public pharmacies deliver ABs. Guidelines have been issued for some infections, although they are not obligatory,. No other measures on AB policy are taken in Croatian NHs. For infection control there are infection control committees in some NHs but no ICPs.

Czech Republic

All NHs in Czech Republic are publicly owned. The mean size of NHs and the mean age of NH residents are smaller than median. Only some NHs have waiting lists. The mean LOS was the lowest of all, 2 months. This is contradictory to the fact that it was registered that NHs offer chronic resident stay. Furthermore, not all types of care are offered. There are some norms and some evaluation scores but no official requirements of application for admission in NHs. In order to assess risk factors the Visual Analogue Scale is used. To evaluate mental status the MMSE is applied. Doctors employed by NHs and certified nurses deliver NH care. Co-ordination of care by a CP and a nursing responsible as well as the tasks of a CP are regulated by law. A medical specialty is not required, although two specialties were

registered for CPs. This might indicate that most CPs have these specialties even though this is not compulsory. Nurses and doctors are at all time present in NHs. Only medical NH doctors prescribe ABs, which are supplied by public pharmacies. There are no measures on AB policy. On infection control there is only the presence of an infection control committee in some NHs. As seen in the tasks of the CP, the CP is responsible for the infection control policy.

Denmark

In Denmark more NH beds than the median value are available for elderly. The mean size of NHs is relatively small. The mean age of residents is equal to the median. Waiting lists exist in some NHs. Long term stay for several types of care is offered in NHs. All norms, all evaluation scores and some restrictions for admission are applied in NHs. Restrictions depend on the severity of a resident's physical and mental condition. Both personal GPs and NH doctors and both home care nurses and certified NH nurses provide NH care. There is no co-ordination by a CP but there are nursing responsables in some NHs (not compulsory). Doctors are in all NHs reachable at all times. Nurses are in some NHs present at all times. ABs are prescribed by the GP or the internal medicine specialist and they are delivered by the public pharmacy. There is no form of AB policy in Danish NHs. It was registered that costs of ABs are partially covered by the resident but this proportion was not specified. Also an infection control policy is absent, although some NHs have infection control committees.

Finland

The proportion of NH beds available for the elderly population in Finland is not very high. NHs are relatively small and the mean LOS is below median. Only some NHs have a waiting list, even though the occupation rate is 100%. The mean age of NH residents is practically equal to the median value. Quite many types of, mainly, long term stay care are offered in NHs. Some norms, restrictions and evaluation scales are used in NHs, but no requirements and exclusion criteria were specified. Medical care is supplied by both personal GPs and NH doctors, which is in some NHs co-ordinated on a voluntary basis by a CP. Even though there were no requirements to the amount of time spent on tasks by a CP, the average number of hours that a CP spends on a resident per year is six. Doctors are present during the day in all and present at night in some NHs. Certified nurses, along with visiting home care nurses and uncertified nurses offer nursing care and are day and night present. A variety of persons can prescribe ABs but only hospital pharmacies deliver ABs. Some initiatives were taken with respect to AB policy; guidelines on infections were issued, there is continuous surveillance of AB use since 2005 on regional level, training of prescribers is given and microbiological sampling is promoted. Also initiatives are taken on infection control. In some NHs there are infection control committees and partnerships between hospital hygiene teams and NHs are regulated. When looking at prescribers the ICP can prescribe ABs while it was registered in the NS that there is no ICP present in Finnish NHs. Partnerships with hospital infection control teams exist since 2006 for communicable diseases.

France

A relatively large amount of NH beds is present in French NHs. The mean NH size and the mean LOS are close to the median value, just slightly higher. Waiting lists are in place in some NHs. NHs have a mixed type of stay, mainly long stay, and offer all types of care in mixed wards. Almost all norms, evaluation scores and some restrictions are being used in the NHs. By means of GIR (AGGIR) scale exclusion criteria are set for physical condition and dependency degree is scored. The Pathos-scale is used for restriction on mental conditions and to assess care load. With respect to risk factors, the Waterlow risk assessment tool is

used for pressure ulcers and also ADL scales and the Mini Nutritional Assessment (MNA) are used. The MMSE and the Neuropsychiatric Inventory (NPI) score are used to evaluate mental status. Personal GPs offer medical care but are only reachable during daytime. Co-ordination of medical care by a CP is strictly regulated by law (presence, specialty requirements, tasks and time spent on co-ordination). Concerning required specialty for CPs, there is a specific degree for CPs in the field of geriatrics called "medical co-ordinator of NH". The mean number of hours to be spent on each resident per year varies between 8.4 and 13 hours. Nurses, both certified and uncertified, are in all NHs present during the day, and present or reachable at night in some NHs. Presence of a nursing responsible or head-nurse is not compulsory, yet it is recommended (in guidelines) in some NHs. ABs are prescribed by GPs and NH doctors, which is contradictory to the fact that only GPs offer NH care. Public and hospital pharmacies deliver ABs. Regarding AB policy, guidelines on varying infection types were voluntarily applied and surveillance of ABs was performed (only rarely) in some NHs. When looking at the CP's tasks it was seen that the CP is responsible for the infection control policy. Only some NHs had infection control committees.

Germany

Some German NHs are owned by free public good services. NHs are well accessible for elderly over the age of 60. The mean size is nearly equal to the median value. The mean age of residents is somewhat higher than median. Not all NHs have waiting lists. Definitive stay for all types of care is supplied in mixed units. There are no restrictions for admission. There are some norms and evaluation scores for care load of application in NHs. For scoring care load Pflegestufen I-III are used. NHs make use of both personal GPs and employed NH doctors for medical care. Next to the medical care as described, it is possible for residents to demand (either with or without reference from a GP) care from a medical specialist. The physicians are at all times reachable and in some NHs present during the day. Certified and uncertified nurses employed by the NH are in most of the NHs present at all times. There is no CP for co-ordination of medical care but in all NHs there is a nursing responsible, not regulated by law, for co-ordination of nursing care. Varying parties can prescribe and deliver ABs. With respect to AB policy only the use of guidelines, which is not compulsory in NHs, was mentioned. The NH resident pays for 10% of AB costs, but the resident never pays more than an excess/a deductible of €10. In some NHs there is an infection control committee, which is not obligated.

Hungary

Hungarian NHs offer all types of care, with a mix of long stay types, in both specialised and mixed wards. Waiting lists exist in some NHs. A few norms, exclusion on infectious criteria and some evaluation scores are applied in NHs. Both GPs and NH doctors offer medical care, which is in some NHs on voluntary base co-ordinated by a CP. Doctors are reachable and present at all times in some NHs. Certified nurses employed by the NH are present during the day, reachable at night in all NHs and present during the night in some NHs. The presence of a nursing responsible is enforced by law. Several types of doctors prescribe ABs, which are supplied by the public pharmacy or through family. Only guidelines for AB prescription on some types of infection are used as AB policy in NHs. With regard to the partial costs of ABs for the account of the resident, this proportion is between 40% and 80%. There is no ICP and only in some NHS an infection control committee is present.

Ireland

Mean size of Irish NHs and the mean LOS are both above the median value. The mean age of residents is close to the median. All types of care with mixed types of resident stay are offered in specialised wards. Only some NHs have waiting lists. All norms are applied in NHs, as well as evaluation scores for all cited categories. Requirements are applied for admission based on age (persons under the age of 65 years are excluded), mental (psychiatric illness is a restriction for admission to some NHs) and infectious conditions (persons with an active *Clostridium difficile* infection are excluded in some NHs). Certain exclusion criteria are set for care load. The Barthel ADL index is applied to score dependency degree. The Norton scale is used to assess pressure ulcers and the MMSE to evaluate mental status. In some NHs GPs offer medical care while in other NHs medical doctors are employed. The doctors are at all time reachable for all NHs and in some NHs present. In some NHs CPs are present, but this is not compulsory. All NHs only employ certified nurses who are in all NHs present and reachable at all times. Presence of a nursing responsible is compulsory for all NHs. A variety of persons prescribes ABs. Public and hospital pharmacies supply ABs to NHs. Within the frame of AB policy, only annual AB consumption data are continuously collected at local level since 2006. The data originate from hospital pharmacies that supply the ABs to NHs. Regarding infection control policy, some NHs have a microbiologist or an infection control nurse as ICP. Their presence is not compulsory. Only some NHs have voluntary infection control committees.

Italy

Italian NHs have the second lowest accessibility, with only few NH beds for the elderly population. Still, only some NHs have waiting lists, likely because elderly are often taken care of by family. The mean size of NHs is just below median. The mean LOS of 2 months is very short, but can be explained by the fact that Italian NHs offer sub-acute care. There are no exclusion criteria for admission. However, it was pointed out that potential residents are evaluated by a NH committee in order to assess admission priorities depending on individual health needs. NHs do use evaluation scales on care load (Resource Utilisation Groups (RUG-III) and at local level other scales), dependency degree (Barthel ADL index and the Instrumental ADL scale), risk (MNA for nutritional status, the Braden, Exton Smith and Norton plus for bed sores, a Swallow test and diphagia outcome test to assess for dysphagia and the Tinetti and Conley scale for falls) and mental status (MMSE and Geriatric Depression scale). Italian NHs are subordinated to all cited norms. Personal GPs and medical NH doctors provide medical care. Certified nurses offer care in all NHs. In some NHs additional care is provided by visiting home care nurses. Doctors are reachable in all NHs day and night. In addition in some NHs they are present during the day. Nurses are physically present in all NHs day and night. Some NHs co-ordinate medical care through a CP. Co-ordination by a nursing responsible is compulsory for all NHs. Different parties prescribe (GP, the medical NH doctor, CP and the specialist) and supply (public and hospital pharmacy and the family) ABs in NHs. A number of initiatives have been taken with regard to AB policy, like guidelines on urinary tract infections, surveillance of AB use, availability of annual AB consumption data and a restrictive AB list. The Italian national formulary does not explicitly define ABs that cannot be prescribed in NHs but it does include a list of ABs that can only be administered in hospital settings. Some of the Italian NHs have an infection control committee. Other parts of infection control policy are not present.

Latvia

In Latvia relatively few NH beds are available for each 100 inhabitants above the age of 60. All NHs have waiting lists. The mean size is rather large, above median level. Chronic care is

offered for all types of care in both specialised and mixed units. A small number of norms are imposed on NHs. For the mental condition the exclusion criteria depend on the NH. With regard to infectious conditions, being a carrier of typhoid Salmonella is an exclusion criterion. Evaluation scales for care load and mental status are of application in (some) NHs. Both GPs and doctors employed by the NH deliver medical care. In all NHs a CP is present. The tasks of the CP and the required specialty, general practice, are regulated by law. Nursing care is supplied by both certified NH-employed and home care nurses. Doctors are during the day reachable and present in some NHs, but are not available during the night. Nurses are in all NHs present and reachable at all times. Nursing care is co-ordinated by a nursing responsible, which is compulsory. Both GPs and NH doctors prescribe ABs. Several parties are responsible for delivering ABs. There are no general measures as part of an AB policy. Only in some NHs an infection control committee is installed as part of an infection control policy.

Malta

Malta has the lowest amount of beds available in relation to each 100 inhabitants above the age of 60. The mean size of NHs is below the median value. The mean age of NH residents which is 68 years, is relatively low. All NHs have a waiting list. Chronic care is offered with respect to basic ADL and hotel service. It can be reasoned that a low mean age is the result of admission of a few persons with (relatively) young age to NHs for revalidation purposes. This can however not be an indicator for the low mean age in Malta since they registered that they do not offer revalidation care in NHs. A number of norms are applicable in NHs. Admission is restricted for persons under the age of 60 years. No evaluation scores are used. GPs and doctors employed by the NH are only reachable during the day. There is no co-ordination of medical care by a CP. Nursing care, offered by certified nurses employed by the NH, is co-ordinated by a nursing responsible. Nurses are reachable and present in all NHs during the day and in some NHs at night. Both types of earlier mentioned doctors prescribe ABs. ABs are delivered mostly by a private pharmacy, and sometimes by a public pharmacy. There is no AB policy in the NHs. It was mentioned that guidelines are not compulsory. The infection control policy is implemented by infection control committees in some NHs.

The Netherlands

The majority of Dutch NHs is publicly owned, only some NHs are privately owned. The accessibility of NHs is relatively low compared to other participating countries. All NHs have waiting lists. The mean size of NHs is among the highest values. The mean LOS is below the median value. The mean age of NH residents is only slightly lower than the median. A number of care types are offered in the categories of chronic and definitive stay. A number of norms are applied as well as restriction criteria for physical and mental condition. The Center for Indication of Care Need decides on admission to a NH based on physical condition. With regard to mental condition inclusion or exclusion is based on required care need. Evaluation scores for care load and risk are used. Scales for assessment of care load and risk factors are set by the Health Care Inspectorate. Only doctors employed by the NH are responsible for the medical NH care, they are present during the day and reachable at all times for all NHs. Co-ordination is performed by a CP, whose specialty and tasks are regulated by law. In the Netherlands there is a specific specialisation in NH medicine. Certified and uncertified nurses deliver nursing care. They are in all NHs present and reachable at all times. A nursing responsible is also present in all NHs. Several types of doctors prescribe ABs, including the GP which is contradictory to the indicated deliverance of medical care in NH (only doctors employed by NH). Public and hospital pharmacies provide ABs. In the field of AB policy, only guidelines for AB prescription are implemented in NHs.

The presence of an ICP is not compulsory, but if present on a voluntarily basis the ICP is mostly an infection control nurse. Some NHs have an infection control committee.

Norway

Norway ranks third in terms of high accessibility to NHs. The mean size of NHs is relatively small. The mean age of NH residents is slightly below median. Even though the occupation rate is 100%, only some NHs have waiting lists. A few types of care are offered and various types of resident stay. All norms are applicable to NHs. There are no minimum requirements for admission. Evaluation takes place for dependency degree and mental status. Medical care is offered by either GPs, NH doctors or the combination of both. Co-ordination by a CP is compulsory in all NHs. CP tasks, only medical resident care, are described by law but there are no requirements with respect to specialty. Only certified nurses employed by the NH offer nursing care and are always supervised by a nursing responsible in all NHs. In all NHs doctors and nurses are reachable at all times. Doctors are present during the day in some NHs while nurses are always present in all NHs. A variety of prescribers and deliverers of ABs are active in NHs. With respect to AB policy non-compulsory guidelines for all cited types of infections have been constructed. Furthermore there is surveillance of AB use, annual consumption data of ABs, NH specific therapeutic formulary, stimulation of microbiological sampling and advice by pharmacists on AB prescription. Also infection control policies are well developed in Norwegian NHs. There is in some NHs (not compulsory) an ICP who is responsible for a large number of infection control tasks. Also, there are in some NHs infection control committees and there are legally regulated partnerships between NHs and hospital infection control teams since 1996.

Poland

Poland is among the countries with the lowest amounts of available NH beds in proportion to the elderly population. Not all NHs have waiting lists, however an occupation rate of 100% was registered. The mean NH size is slightly above the median value. All types of care are offered in specialised wards. The type of resident stay is chronic or mixed. NHs are subordinated to all mentioned norms. Certain physical (a terminal stage of cancer and/or having a stomach feeding tube) and infectious conditions (tuberculosis) form a restriction for NH admission, but no evaluation scales are used. Both GPs and NH doctors are responsible for medical care, but there is no co-ordination by a CP. Doctors are not physically present but are for some NHs reachable 24h. In all NHs uncertified nurses are present together with certified nurses employed by the NH or certified visiting home care nurses. Nurses are always present in all NHs. In all NHs there is a nursing responsible, of which presence is compulsory in some NHs. GPs, NH doctors and internal medicine specialists are responsible for the prescription of ABs. ABs are supplied by public and hospital pharmacies. For some types of infection guidelines for AB prescription are available. Furthermore, as part of AB policy, prescription profiles are available. In Poland there is neither feedback nor contact with outliers about prescription profiles. Costs of ABs are partially paid for by the resident, however the proportion of the costs covered by NH residents was not specified. With respect to infection control, some NHs have infection control committees.

The Russian Federation

The mean size of Russian NHs is the largest of all participating countries, with 350 beds per institution. Waiting lists are present in all NHs. The mean LOS is also the highest of all participating countries, although also a short LOS is registered for rehabilitation care. Russian NH residents have a relatively low mean age of 55. All cited types of care are offered with mixed types or definitive resident stay. In all NHs there are admission

requirements with respect to age (men under the age of 60 years and women under the age of 55 years are excluded), mental (acute psychiatric disorders limit admission) and infectious conditions (tuberculosis, HIV/AIDS, sexually transmitted diseases, scabies and pediculosis). No evaluation scores are applied in NHs. Medical care is provided by either doctors employed by the NH or a combination of NH doctors and personal GPs. Co-ordination by a CP takes place, as laid down by law, in all NHs. A large number of tasks are imposed on the CP by law, though a certain specialty is not required. The mean amount of time spent by the CP per year on each resident is unknown. Only certified nurses employed by the NH supply nursing care, under supervision of a nursing responsible. Doctors are present in all NHs during the day and in some NHs during the night. Nurses are always present in all NHs. Different parties prescribe ABs, while ABs are delivered by wholesalers or through family members. Some initiatives are taken in terms of AB policy. Non-compulsory guidelines are available for AB prescription. Surveillance of AB use is performed at local level and a compulsory NH specific therapeutic formulary for ABs is used since 2004. The presence of an ICP is compulsory. Both doctors and nurses can be an ICP. Certain tasks are legally enforced to the ICP. Responsibility for the infection control policy is also part of the tasks of the CP. Infection control committees are present in some NHs.

Slovenia

The accessibility to NHs in Slovenia is relatively high; the amount of available beds for the elderly is above the median. The mean size of NHs is the second largest. The mean LOS is also relatively high. All NHs have a waiting list. All types of care are offered in mixed units. All cited norms are applicable to NHs. Restriction criteria for admissions are used for age (persons under the age of 65 years are excluded) and infectious condition (methicillin-resistant *Staphylococcus aureus*), however no evaluation scores are used. In Slovenia a resident loses his personal GP when submitted to a NH. A doctor working for the NH, with a GP specialty, delivers care to NH residents. This GP is not employed by the NH but by the public health system. The doctors can only be reached during daytime. The presence of a CP is compulsory in all NHs. The tasks and the specialty of the CP are not regulated. Five hours have to be spent per year on each resident by the CP. In all NHs nursing care is supplied by certified nurses employed by the NH and co-ordinated by nursing responsables. Nurses can always be reached and are always present. ABs are prescribed by the CP or the internal medicine specialist. Public and hospital pharmacies supply ABs. There are guidelines on some types of infection available for NHs. Also, with regard to AB policy, AB prescription profiles are available, however only on demand, for which outliers are contacted. Furthermore training of prescribers, stimulation of microbiological sampling, data collection on drug resistance profiles and advice of pharmacists were initiated in NHs. Infection control policy is carried out by ICPs. Doctors and nurses can be an ICP, which is not compulsory. In addition, some NHs have an infection control committee.

Sweden

Sweden has second highest amount of NH beds available for the elderly population. Yet, all NHs have waiting lists. The mean size of the NHs is the second smallest. The mean age of NH residents is the highest of all. All types of care are offered in both mixed and specialised wards. Many norms and restriction criteria for age and physical condition are applied in Sweden. Persons under the age of 65 years are excluded from admission. With regard to physical condition, being in need of ventilation, having a tracheostomy and need for certain advanced medical care are exclusion criteria next to other restrictions decided on by regions. Evaluation scores are applied in some NHs for care load, dependency degree, risk and mental status. The Katz scale is applied for care load and dependency degree. In addition,

the Berger scale is used for dependency degree and mental status. Also the MMSE and the Behavioural scale are used to assess the mental status. For assessment of pressure ulcers as risk factor the Norton scale is used. Medical care is supplied by either GPs or doctors employed by the NH. Medical care can also be provided by geriatric consultants. In some NHs presence of a CP is compulsory and also the CP's tasks and specialty are regulated. In all NHs certified nurses offer care. The head-nurse is responsible for all NHs in one particular area. In all NHs doctors and nurses can be reached during the day. In some NHs doctors and nurses are present during the day and nurses are present in some NHs at night. Different parties are responsible for prescribing and delivering ABs. Guidelines for AB prescription are applied in NHs, but are not compulsory. Furthermore, data is collected on drug resistance profiles and annual consumption data is available, but is limited. In Sweden an excess/a deductible of 1800 Swedish krona is paid by the resident, all AB costs above that threshold are fully reimbursed. NHs do not have an ICP. Further information on infection control policy in Swedish NHs is lacking.

United Kingdom

Only in Northern Ireland all NHs are privately owned, although a few NHs are owned by local health boards. In Scotland NHs are the smallest of all participating countries. Also in England and Northern Ireland NHs are relatively small. The mean LOS in England and Northern Ireland (no information for Scotland) are both below the median value. Across all the UK only some NHs have waiting lists. The mean age of NH residents is close to the median in Northern Ireland and is the second highest of all participating countries in England (no data from Scotland). Different types of care are offered in England and Scotland and all cited types of care are offered in both specialised and mixed wards in Northern Ireland. Also differing types of resident stay are offered in the three countries from the UK. England and Northern Ireland offer more long term stay care and Scotland offers next to long term stay also sub-acute care. In England and Northern Ireland all cited norms are applied. In Scotland only norms are applied for quality of care and safety. Restrictions for admission based on physical and mental condition are in all three countries applied and additionally based on age in Northern Irish and Scottish NHs. Furthermore, in Northern Ireland any restriction on age depends on the type of care needed in relation to what type of care a NH can provide. Terminal care, rehabilitation and convalescence know restrictions for admission based on physical condition in England. In Northern Ireland restrictions for physical condition depend, as for age, on NH care type. Regarding mental condition, in Northern Ireland some NHs reject persons with for example dementia while other NHs accept specifically these patients. In England some NHs refuse to accept persons with dementia, learning disabilities and acute or chronic mental health problems. Scotland indicated having requirements and exclusion criteria but did not specify these, only categories were indicated. Evaluation scores on dependency degree, risk and mental status are used in NHs in the entire UK and on care load in Northern Ireland and Scotland. Northern Ireland applies for care load, dependency degree and mental status several risk assessment tools before admission; government regulations set Nursing Home Minimum Standards and a tool called Care of Dying Pathway is applied. The Barthel ADL index is in use in England for assessing the degree of dependency. Regarding risk factors, the Waterlow risk assessment tool is used in England for pressure ulcers and Northern Ireland uses a Therapy Fall Risk Assessment tool, a Pressure ulcer risk assessment and a Malnutrition universal screening tool. To evaluate mental status England uses the MMSE. Medical care in NHs in the UK is supplied by personal GPs. In Northern Ireland medical care in NHs is also delivered, if relevant, by psychiatric consultants. In none of the countries medical care is co-ordinated by a CP. In Northern Ireland the medical activities in the NH are co-ordinated by a certified nurse instead of a doctor. In all three participating countries nursing care is supplied by certified nurses. In Scotland this is complemented by visiting home care nurses and uncertified nurses in some NHs. In all three

countries a nursing responsible is present in (some) NHs. Only in Scotland this is not compulsory. Doctors can be reached in all NHs at all times. Nurses are reachable and present at all times in all NHs in England and Northern Ireland and only in some NHs in Scotland. GPs prescribe most ABs and public pharmacies deliver most ABs in all three countries. England indicated that next to the GP also a visiting hospital consultant can prescribe ABs. Northern Ireland was the only country indicating that nurses can prescribe ABs. The remark was made that only a registered nurse is allowed to do so. In England and Northern Ireland guidelines for AB prescription are available. In all three countries prescription profiles are available. In England and Northern Ireland regular feedback is given to prescribers and care providers with deviant prescribing behaviour are contacted. In Scotland only regular feedback is given. England and Northern Ireland have profiles available since 1988 and 1990, respectively. In Northern Ireland implementation of AB guidelines is not compulsory, however recommended because GPs are monitored in their prescribing patterns. No other measures on AB policy were taken in any of the countries. With respect to infection control, Northern Irish NHs make use of infection control nurses, which is not compulsory. Northern Ireland explicitly indicated that the answers to the question on the tasks of an ICP are an indication of the tasks performed by the ICP for the NHs only in which a nurse was appointed responsible for infection control. In Northern Ireland the infection control nurse is not the one who gives training to nursing and paramedical staff but the nurse should ensure that the staff follows training. Furthermore, the nurses in Northern Ireland are responsible for monitoring compliance with all infection prevention control measures, of which hand hygiene as mentioned in Table 17 is just one component. An infection control committee is installed in some English and Scottish NHs.

APPENDIX 6: ELABORATION ON REQUIREMENTS & RESTRICTIONS AND APPLIED EVALUATION SCALES & SCORES

Restriction of NH admission with respect to physical condition can be assessed by means of the Katz scale. The full name of the Katz scale is the Katz Activities of Daily Living (ADL) Scale. The Katz scale measures the ability of a person to perform basic ADL. Six types of activities are scored for the level of independency:

- bathing
- dressing
- toileting
- transferring
- continence
- feeding. (17)

In France the AGGIR scale is used to assess physical condition as a requirement or restriction for NH admission. AGGIR is the abbreviation of the French name of the scale: Autonomie, Gérontologie, Groupes Iso-Ressources. The AGGIR measures the dependency of elderly in order to determine the level of necessary care and hence the level of use of resources (GIR). Then types of ADL are scored:

- coherence (in behaviour)
- orientation
- toilet (personal hygiene)
- dressing
- feeding
- elimination (urine and faeces)
- transfers (lying, sitting and standing)
- moving indoors
- moving outdoors
- distance communication

Each variable consists of three answer options:

- A. activity was performed independent, completely, habitually and correct
- B. activity was performed partially, or not habitually or correct
- C. activity was not performed at all.

The allocation to iso-resources group is done by calculating the values of the A, B or C score for each variable. An iso-resource group represents persons with equal levels of consumption of (care) resources.

The six GIR groups are:

1. Persons who have lost their complete mental, physical, movement and social autonomy and who require continuous presence of caregivers.
2. (2 groups) Elderly who are bedridden but who have no or partial impairment in mental functioning or persons with impaired mental functions without physical impairments in need of permanent surveillance and repetitive care.
3. Persons without mental impairments but with partial loss of movement autonomy in need of daily, multiple times per day, assistance for excretory functions.
4. (2 sub-categories) Persons who have ambulatory difficulties but who can move themselves and persons without movement problems in need of care in physical activities.
5. Persons in need of surveillance and assistance with domestic activities
6. Persons are fully autonomous for ADL without any need for assistance. (18)

The Dutch Center for Indication of Care Need assesses a person's need for care before deciding on the type of care (and on the budget) and hence on requirements for admission to a NH. The indication assessment takes place by use of the International Classification of Diseases (ICD-10), the Diagnostic and Statistical Manual of mental disorder (DSM-IV) and the International Classification of Functioning, Disability and Health (ICF). The need for care, the ability to perform (undefined) activities of daily living scored in categories from zero to three varying from complete independence without any aid in perform activity, ability to perform activity independent but with supervision or stimulation, partial ability to perform activity independent with partial assistance, to complete dependency for performing activity (19).

The PATHOS model, as applied in France, is used to assess mental condition for restricting or requiring NH admission. The model consists of 50 medical conditions common in geriatrics, which a person can suffer from on the day of evaluation. The severity of each condition is assessed by means of 12 possible profiles of care. Not all medical

conditions can be matched with all 12 care profiles. The model consists of 240 pairs of conditions and care patterns. For all of these 240 pairs the required level of care is determined for eight medical disciplines based on the mean level of need for care per person.

The 12 care profiles are:

1. T1: care existing of multiple daily medical supervision
2. T2: medical surveillance multiple times per week and continuous (24h/24h) presence of a nurse
3. P1: heavy psychiatric care, state of crisis
4. P2: continuous psychiatric care, psychotherapeutic support
5. R1: intensive individual functional rehabilitation
6. R2: collective functional rehabilitation
7. CH: intensive wound care, (e.g. after recent surgery or for large wounds) requiring daily (or on every two days) nursing care for at least 20 minutes
8. DG: care for a yet undiagnosed disease
9. M1: psychological counseling and technical support, palliative care
10. M2: counseling for persons in a state leading to death or to a long term care need, care to comfort persons in an unconscious state
11. S1: scheduled long-term surveillance of patients with stabilized chronic conditions and treatments
12. S0: absence of any surveillance or treatment (care is unnecessary or ineffective).

The eight types of care in the model are:

- geriatrician, general practitioner
- psychiatrist
- nursing care
- rehabilitation
- psychotherapy
- laboratory tests
- medical imaging
- pharmacy. (20)

Some of the scales and scores applied in NH for evaluation purposes are equal to systems that set restriction and requirement criteria for admission. The Katz scale is used in Sweden and in Belgium to evaluate care load and dependency degree. The PATHOS model and the AGGIR model are used in France to evaluate care load dependency degree, respectively.

The RUG-III system is used in Italy to assess care load. RUG is the abbreviation of Resource Utilisation Groups, and III stands for the third version. The RUG are determined by responding to 109 items on the level of disability in ADL of the elderly to predict the type and quantity of care (in time spent by caregivers) needed. Residents are ordered into seven main hierarchical categories based on these responses. The seven categories are:

- Rehabilitation
- Extensive care (e.g. need for parenteral feeding, tracheostomy)
- Special care (e.g. quadriplegia, severe pressure ulcers)
- Clinically complex care (e.g. aphasia, terminal illness, need for dialysis)
- Impaired cognition
- Behavioural problems
- Reduced physical function.

The main categories are subdivided into 44 RUGs, based on ADL disability, depression and the need for specialised care. One RUG contains patients with comparable care needs. Patients who can be assigned to more than one RUG are assigned to the group with the highest resource use (21;22).

In Germany Pflegestufen are used to evaluate care load. Pflegestufen is German for level of care or nursing dependency level. Pflegestufe is an indicator for the need for care based on the volume and the nature of care dependency. The Pflegestufe indicates the amount of care (in time) required. There are three Pflegestufen to which elderly can be assigned that increase in amount of time from 38 hours to 85 hours per week. The three Pflegestufen are:

- I. little dependency but need for care
- II. average dependency, higher need for care
- III. heavy dependency, very high need for care. (23)

In the Netherlands care load in NHs is evaluated by the Dutch Health Care Inspectorate. The Health Care Inspectorate (in Dutch: Inspectie voor de Gezondheidszorg) issued several indicators that NHs must adhere to in order to guarantee quality of care. For NHs these are client-related indicators, measured by surveying the clients, and care-related indicators, measured on client- and on organisational level. The latter indicators encompass measurement of pressure sores, falls and

incontinence amongst others. These indicators are likely to be used in NHs to assess care load and risks (24).

Northern Ireland evaluates care load, dependency degree and mental status by means of Minimum Standards. The Nursing Home Minimum Standards that are applied in Northern Ireland are set to ensure quality of care by specifying standards for arrangements, facilities and procedures that have to be met. The NH Minimum Standards are issued by the Department of Health, Social Services and Public Safety of the Northern Irish government. One of the standards deals with the delivering of care based on an assessment of the need for care prior to admission (the restriction measure in this survey) and assessment which continues after admission (assessing the care load with scales and scores). Also a risk assessment carried out with validated tools is part of the standards (assessing risk with scales and scores). Also several risk factors (e.g. pressure ulcers) are mentioned separately in the standards. Also the use of a recognised Care of the dying pathway or tool is described in the NH Minimum Standards (25).

Dependency degree can be evaluated by means of the Barthel index. The Barthel ADL index which is used in England, Ireland and Italy measures the (independent) performance of basic ADL. Ten types of ADL are described:

- feeding
- moving/ transfer
- personal toilet/grooming
- toilet use
- bathing
- walking/mobility
- stairs (climbing and descending)
- dressing
- bowel control
- bladder control

The ability of being able to perform the activities independently is scored with a fixed score for needing help and for being independent. A higher score is given when a person is more independent. The maximum score for all items together is 100, indicating that a persons is fully autonomous (26;27).

In Italy an instrumental ADL scale is used, next to the Barthel ADL index, to evaluate dependency degree. The difference between basic ADL and instrumental ADL is that basic ADL are the skills that are performed for daily self care while instrumental ADL are more complex skills beyond basic self care that are necessary to live independently in a society.

The instrumental ADL consists of eight items:

- using the telephone
- shopping
- food preparation
- housekeeping
- laundry
- using transportation
- responsibility for own medications
- ability to handle finances

Each item is scored, with a higher score indicating more independency, and zero meaning not performing the activity at all (28).

One of the possible risks that can be evaluated in NHs is the risk for pressure ulcers. In England and France the risk of developing a pressure ulcer is evaluated by use of the Waterlow score.

There are six items and four other risk factors scored in this scale:

- relationship between weight and height (Body Mass Index)
- continence (urinary and/or fecal)
- skin condition
- mobility
- sex and age
- appetite/nutrition
- special risk factors:
 - o tissue malnutrition
 - o neurological deficit
 - o surgery
 - o medication

Each item is scored and the total score indicates the risk for developing pressure ulcers (29;30).

Italy uses different scales for the evaluation of pressure sores. The Braden scale offers a method to predict the risk for pressure sores. The scale consists of six subscales which are scored:

- sensory perception (response to pressure-related discomfort)
- skin exposure to humidity
- degree of physical activity
- mobility
- nutrition (usual food intake pattern)
- friction and shear.

Every item consists of categories of severity and is scored accordingly. A low total score for all subscales together indicates a higher risk for developing pressure sores (29;31;32).

The Norton scale is a method to assess the risk for pressure sores that is applied in NHs in Ireland and Sweden. The scale consists of five items:

- physical condition
- mental state
- activity
- mobility
- continence

Each item contains four categories which represent a score. A higher score indicates a better situation, thus a low score indicates a high risk for developing pressure ulcers (29;33).

The Norton Plus scale, used in Italy, adds several categories (to be answered with yes or no):

- diagnosis of diabetes
- diagnosis of hypertension
- hematocrit (male < 41%, female < 36%)
- hemoglobin (male < 14 g/dl, female < 12 g/dl)
- albumin level (< 3.3 g/dl)
- febrile (> 37.6°C)
- five (or more) medications
- changes in mental status to confused, lethargic within 24 hours. (33)

In Italy also the Exton-Smith scale is applied in NHs to evaluate the risk for pressure sores. This scale is used to measure the incidence and severity of pressure ulcers by scoring:

0. none
1. persistent erythema
2. localised blister

3. superficial sore
4. deep sore
5. extensive gangrenous sore

Any score of at least one counts as incidence, and the maximum score indicates the severity of the pressure ulcer (34).

Another risk playing a role in NHs is malnutrition. To evaluate this risk France and Italy use the Mini Nutritional Assessment (MNA). The MNA is constructed to identify elderly at risk for malnutrition or elderly who are malnourished. The first step of the MNA is screening for the presence of (risk of) malnutrition and consists of six items. The second step is an assessment of those at risk of malnutrition and consists of twelve additional items. In the complete MNA there are hence 18 items that can be grouped into four categories: an anthropometric assessment (anthr.), a general assessment (gen.), a short dietary assessment (diet.) and a subjective assessment (subj.).

The six items from the first screening step are:

- food intake (diet.)
- weight loss (anthr.)
- mobility (gen.)
- psychological stress or acute disease (gen.)
- neuropsychological problems (gen.)
- Body Mass Index (anthr.)

The twelve additional items of the assessment are:

- living independently (gen.)
- medication (gen.)
- pressure sores or skin ulcers (gen.)
- number of meals per day (diet.)
- protein intake (diet.)
- daily fruit and/or vegetable consumption (diet.)
- daily fluid intake (diet.)
- autonomy of feeding (diet.)
- self perception of nutritional status (subj.)
- self perception of health status (subj.)
- mid-arm and calf circumference (anthr.)

Each item consists of several answer categories each with a fixed score. The total score determines whether a person is well-nourished (high score), at risk for malnutrition (medium score) or malnourished (low score) (35).

Another important risk for NH residents is the risk of falling. In Italian NHs two types of evaluation scores can be applied. The first is the Tinetti scale. Different versions of the Tinetti scale exist with a varying number of items. Balance is tested by means of 13 or 14 items and gait is tested with nine or ten items. The tasks were scored for being able to perform a task normally or abnormally or not being able to perform the task. A higher score indicates a better performance and hence a lower risk of falling (36;37).

In Italian geriatric units the subset of balance items are usually tested. These tasks are:

- sitting balance
- sit-to-stand (arising from seat)
- standing balance with open eyes
- standing balance with closed eyes
- turning balance in performing a 360° turn on-the-spot
- stand-to-sit (sitting down). (38)

The Conley scale is another scale to assess the risk for falls. The scale consists of the following items:

- history of falling: during the last three months
- observations:
 - o impaired judgment or lack of safety awareness
 - o agitation
 - o impaired gait, unsteady walk
- experienced dizziness or vertigo
- incontinence on way to the bathroom

The presence of each item is scored. A higher score indicates an increased risk of falling (39).

In Northern Ireland several evaluation scores are of application for varying risks. The Fall Risk Assessment is a tool used in NHs in Northern Ireland to assess the risk of falling for elderly. This tool consists of several criteria:

- age
- gender
- history of falls
- level of functional mobility
- balance
- footwear

- visual problem identified
- medication
- mental state. (40)

The pressure ulcer risk assessment is not a risk assessment tool as such but is a guideline of application in the UK. This guideline describes identifying persons at risk, risk factors and prescribes the use of risk assessment tools to predict the risk of falling (41).

The Malnutrition Universal Screening Tool (MUST) is used to identify the risk for malnutrition. MUST consists of three criteria:

1. weight status (BMI)
2. unplanned weight loss
3. presence of an acute disease (no nutritional intake for more than five days)

These items are scored resulting in a total score indicating the risk of malnutrition. A higher score indicates an increased risk (42).

In the Czech Republic a visual analogue scale (VAS) is used to evaluate risks. The VAS scale is used to measure subjective views on health status of an individual. The VAS is a straight line with descriptions on both ends that describe the variable that is measured. In some cases a scale is added (43).

To evaluate mental status Belgium, the Czech Republic, France, Ireland, Italy, Sweden and England apply the Mini Mental State Examination (MMSE). The MMSE is used to detect cognitive impairment. Five areas of cognitive function are tested in 11 questions. These areas are:

- orientation (in time and place)
- registration (repeating)
- attention and calculation
- recall
- language (describing, understanding and basic motor skills).

A lower score indicates a more severe cognitive impairment (44).

The Neuropsychiatric Inventory (NPI) is used in French NHs to evaluate mental status. The NPI is developed to assess behavioural changes in persons with neurologic illness. The input for the NPI is given by a caregiver familiar with the concerning person or by a family member.

The NPI can consist of ten or twelve behavioural domains. These behavioural aspects are:

- delusions
- hallucinations
- agitation/aggression
- depression/dysphoria
- anxiety
- euphoria/elation
- apathy/indifference
- disinhibition
- irritability
- motor disturbance (compulsive behaviour)
- changes in sleep and nighttime behaviour (additional in the NPI with twelve items)
- changes in appetite/eating (additional in the NPI with twelve items)

Both frequency (presence) and severity of each behavioural aspect are scored (45;46).

In Italy, lastly, the Geriatric Depression Scale (GDS) is used for evaluation of mental status of elderly. The GDS consists of thirty items to assess the presence of depression in elderly. These items are responded by either yes or no based on the feelings of the respondent. Each item is scored. A higher total score indicates a more severe depression. A low score below a certain threshold equals absence of depression. Questions concerns topics like satisfaction with life, feeling helpless, feeling energetic, feeling fear, worrying etcetera (47). There is also a short form of the GDS with 15 questions, which are selected from the 30 questions from the original scale (48).

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