Point Prevalence Survey of Healthcare-Associated Infections & Antimicrobial Use in Long-Term Care Facilities (HALT): May 2013

A Summary of General Nursing Home Data

REPUBLIC OF IRELAND: NATIONAL REPORT – MARCH 2014

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PLEASE NOTE:

This report represents a shortened version of the full national HALT report focusing on data from General Nursing homes.

The full national report including methodology, results on all LTCF care types, discussion and future priorities can be found on the hpsc website here.

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Executive Summary

In May 2013, 9,318 residents in 190 Irish long-term care facilities (LTCF) were included in a European point prevelance survey (PPS) of healthcare-associated infections (HCAI) and antimicrobial use. The survey is also known as the HALT survey. This is the national report for Ireland.

Aims of the HALT survey

1. To calculate the prevalence of healthcare-associated infections (HCAI) in residents of Irish LTCF
2. To calculate the prevalence of and indications for antimicrobial use in Irish LTCF
3. To provide the Irish Government, Department of Health, Health Service Executive, the managers, doctors and nurses caring for residents in all of the LTCF that took part, with information for action: to reduce the numbers of residents who develop HCAI and to influence positive antimicrobial stewardship practices in LTCF
4. To provide residents, their families and members of the public with more information about HCAI in Ireland and which types of infections are most commonly seen in Irish LTCF

Participating LTCF

- Of the 190 LTCF, the majority were owned by the Health Service Executive (HSE) [n=128; 67%], followed by private [n=39; 21%] and voluntary services [n=23; 12%]
- The median capacity of participating LTCF was 46 beds (range = 5 – 203) and the median bed occupancy on the HALT survey date was 94%
- Overall, single room accommodation accounted for a median of 34% of available beds. The proportion of single room accommodation was much lower in HSE-owned than privately-owned LTCF (21% versus 76%)
- For the purposes of data analysis and reporting, the HALT steering group stratified the 190 LTCF into the following care type categories, based on the characteristics and estimated length-of-stay (LOS) for the majority of the residents:
    i. **General nursing homes >12 months (GN>12m):** 103 long-stay facilities with 5,807 residents
    ii. **Mixed care type facilities >12 months (Mixed>12m):** 26 long-stay facilities with 1,409 residents

iii. **LTCF caring for residents with intellectual disabilities (Intellectually disabled):** 24 facilities with 1,060 residents

iv. **LTCF (either general nursing homes or mixed care type facilities) <12 months (LTCF<12m):** 15 short-stay facilities with 374 residents

v. **LTCF caring for residents with psychiatric conditions (Psychiatric):** 11 facilities with 345 residents

vi. **Other care types:** Facilities caring for residents with palliative care needs (4 facilities with 89 residents) rehabilitation needs (3 facilities with 139 residents), physical disabilities (2 facilities with 46 residents) and 'other' care types (2 facilities with 49 residents)

Coordination of medical care, infection prevention & control & antimicrobial stewardship

- Overall, resident medical care was provided by the resident's own general practitioner (GP) in 35%, by a directly-employed doctor in 41% and by a mix of GP plus directly-employed doctor care in 24% of LTCF. However, when LTCF were stratified by ownership, GP-led medical care predominated in privately-owned LTCF (82%) versus HSE-owned (35%) LTCF
- A designated coordinating physician, with responsibility for coordination and standardisation of policies/practices for resident medical care within the LTCF was available for only 45% of LTCF overall and for only 26% of privately-owned LTCF. Where a coordinating physician was in post, the reported roles undertaken infrequently included development of local infection prevention and control (IPC) (16%) or antimicrobial prescribing policies (14%)
- One third of LTCF reported having no active local infection prevention and control committee (IPCC)
- Access to a staff member with training in IPC was reported by 62% of LTCF overall and by only 10% of privately-owned LTCF. For the vast majority of LTCF with a trained IPC staff member, that person was an infection prevention and control nurse (IPCN) (93%). For the majority of LTCF, the IPCN was not based in the LTCF on a day-to-day basis (71%)
- Following the HALT survey, additional information was sought to estimate the national number of whole time equivalent (WTE) IPCNs for LTCF: In 2013, it is estimated that there was one WTE IPCN for every 496 LTCF beds in Ireland

- Although the vast majority of LTCF reported the presence of a written local hand hygiene policy (97%), the provision of regular staff hand hygiene training sessions was not universal, with only 88% of LTCF reporting that such a session had been arranged in the past 12

  months. Medical and allied health professional staff were less likely to be invited to attend such training sessions than nursing and hygiene services staff. In addition, 19% of LTCF reported having no system in place for the organisation, control and feedback on hand hygiene
- The provision of seasonal influenza vaccination for residents was not universal, with 6% of LTCF overall reporting this was not routine local practice
- The vast majority (95%) reported having no active local antimicrobial stewardship committee (ASC), training on antimicrobial prescribing was not provided by 95% and just over two thirds (68%) of LTCF reported having no local antimicrobial prescribing guidelines
- Prescriber feedback regarding local antimicrobial use and local microbiology laboratory antimicrobial susceptibility data for common pathogens causing infection was available in only a minority of LTCF (13% and 7%, respectively)
- LTCF with a designated coordinating physician were significantly more likely to demonstrate positive local antimicrobial stewardship practices such as; an active ASC, prescribing guidelines, restrictive prescribing policy and provision of antimicrobial consumption data

Resident demographics, nursing care requirements and HCAI risk factors

- Female residents predominated across all care types and the proportion aged ≥85 years was highest in GN>12m (47%), Mixed>12m (41%) and LTCF<12m (38%). In contrast, only 1% of intellectually disabled LTCF residents were aged ≥ 85 years
- Indicators of resident nursing care requirements (incontinence, disorientation and impaired mobility) were evident in all care types, but most prevalent in GN>12m, Mixed>12m and LTCF<12m
- HCAI risk factors (presence of urinary or vascular catheter, pressure sores or other wounds) were most prevalent in residents of palliative care LTCF
- It was largely uncommon for residents to have a history of recent surgery, other than in rehabilitation facilities (5%) and LTCF<12m (4%)

HCAI

- The national crude HCAI prevalence was 5.3% and the national median HCAI prevalence was 4.2%. The median prevalence was higher in rehabilitation (7.8%), LTCF<12m (8.3%), Mixed>12m (6.1%) and the highest prevalence was reported in palliative care (18%), which

  may reflect the HCAI risk factors encountered in that unique resident cohort. The lowest median HCAI prevalence was reported from GN>12m (4.2%) psychiatric (4.3%) and physically disabled LTCF (no HCAI detected in 46 residents)
- The most prevalent HCAI types were: respiratory tract infections (RTI), urinary tract infections (UTI) and skin infections; affecting 1.9%, 1.7% and 1.3% of all residents, respectively

Antimicrobial use and antimicrobial resistance

- The national crude antimicrobial use prevalence was 9.8% and the national median antimicrobial use prevalence was 9.7%. The median prevalence was higher in LTCF<12m (11.2%). At 24.5%, the prevalence in palliative care was more similar to antimicrobial use prevalence reported from acute hospital settings
- The majority of antimicrobials were prescribed within the LTCF (81%), mainly by GPs and directly-employed doctors
- Whilst the majority of antimicrobials were prescribed to treat infection, the proportion that were prescribed for infection prevention/prophylaxis was particularly high in intellectually disabled LTCF (49%), GN>12m (39%) and Mixed>12m (35%)
- During HALT 2013, 3.2% of GN>12m, 2.9% of Mixed>12m and 2% of intellectually disabled LTCF residents were prescribed antimicrobials for UTI prophylaxis. Prophylaxis against RTI (1.9%) and skin infection (1.4%) was most prevalent in intellectually disabled LTCF
- A relevant microbiological specimen had been obtained for just over one quarter of antimicrobial prescriptions (27%), with *Escherichia coli* (33%) and *Staphylococcus aureus* (22%) the two most frequently reported pathogens. Of those with available antimicrobial susceptibility results, 29% of *E. coli* were resistant to 3rd generation cephalosporins and 44% of *S. aureus* were meticillin/flucloxacillin resistant (i.e., MRSA). There were no carbapenem resistant *Enterobacteriaceae* reported during the HALT survey

1. Results

1.1 National Overview

1.1.1 Description of Participating LTCF

There was an excellent response to participate in the voluntary 2013 HALT survey, with a continued increase in participating LTCF; from 69 (2010) to 108 (2011) to 190 (2013), as displayed in Table 3.1.1. Fifty LTCF have participated in all three HALT surveys to date, 33 participated in 2011 and again in 2013, with 100 (53%) participating in HALT for the first time in 2013. In 2013, a designation for voluntary ownership was included for the first time.

There has also been an annual increase in participating LTCF across all care types. LTCF delivering care to eight major resident care types participated in HALT 2013, with four care types having more than one participant for the first time in 2013 [palliative care, physically disabled, and rehabilitation LTCF] (Table 3.1.1).

Table 3.1.1 Annual increases in HALT participation, by ownership, HSE region and care type.

Category	**2010**	**2011**	**2013**
by Ownership			
HSE	61	84	128
South	8	18	38
West	32	34	42
Dublin Mid Leinster	14	22	23
Dublin North East	7	10	25
Private	8	24	39
Voluntary	N/A	N/A	23
by Care Type			
General nursing homes	30	58	112
Mixed care facilities	16	16	32
Intellectually disabled	8	15	24
Psychiatric	3	5	11
Palliative care	1	1	4
Physically disabled	1	1	3
Rehabilitation	1	1	2
Other	3	1	2
National	**69**	**108**	**190**

* Other care types in 2013 included: a young chronically ill unit and a paediatric mixed care unit.

Figure 3.1.1 displays the distribution by county and by percentage of HIQA-registered residential care settings for older people that participated in HALT 2013.

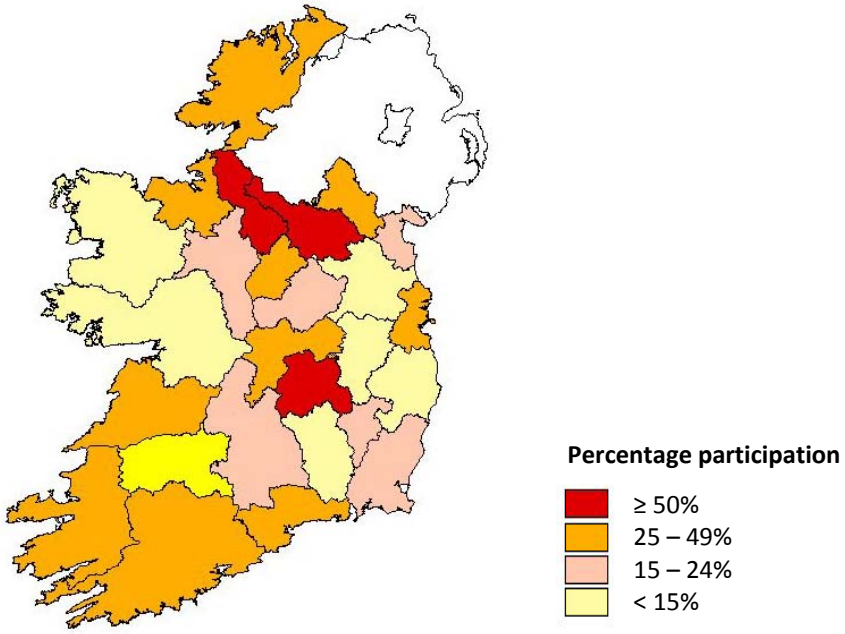

Figure 3.1.1 Distribution, by county and by percentage of HIQA-registered residential care settings for older people that participated in HALT 2013.

Table 3.1.2 displays participating LTCF, by care type and by the estimated LOS for the majority (>75%) of each LTCF's residents. Most (n=166; 87%) estimated that the majority of their residents were expected to remain in the LTCF indefinitely (i.e., for a period between 12 months until end-of-life).

Table 3.1.2 Breakdown of LTCF care type, by estimated LOS *

Care Type	Length of stay of majority of residents					Total
	<3 months	3-12 months	>12 months	until end-of-life	Other	
General nursing care	5	4	6	97	0	**112**
Intellectually disabled	0	0	2	22	0	**24**
Mixed facility	3	3	9	17	0	**32**
Other	0	0	0	2	0	**2**
Palliative care	2	0	0	1	1	**4**
Physically disabled	0	0	1	1	0	**2**
Psychiatric	0	1	3	5	2	**11**
Rehabilitation	3	0	0	0	0	**3**
National	**13**	**8**	**21**	**145**	**3**	**190**

*Estimated LOS of the majority of residents admitted to the LTCF = expected LOS for >75% of residents.

The HALT Steering Goup agreed to further stratify participating LTCF for data analysis, taking into account both care type and LOS. Thus, LTCF were categorised into eight care types, as displayed in Table 3.1.3.

- The two largest LTCF categories, general nursing homes and mixed care type facilities were further divided into three groups based on estimated LOS for majority of residents:
    - General nursing homes with estimated LOS >12 months (long-stay) = GN>12m
    - Mixed care type facilities with estimated LOS >12 months (long-stay) = Mixed >12m
    - LTCF (either general nursing homes or mixed care type facilities) with estimated LOS <12 months (short-stay) = LTCF <12m
- LTCF caring for residents with intellectual disabilities (Intellectually disabled)
- LTCF caring for residents with psychiatric conditions (Psychiatric)
- Other care types: Facilities caring for residents with palliative care needs, rehabilitation needs, physical disability or other care types

GN>12m accounted for the majority of participating LTCF (n=103; 54%), followed by Mixed>12m (n=26; 14%) and intellectually disabled LTCF (n=24; 13%). The remaining 37 LTCF (19%) were distributed among a variety of other care types (Table 3.1.3).

Table 3.1.3 also displays further breakdown of each care type, by ownership, size, overall bed occupancy and availability of single rooms. Overall, there was a median of 46 beds (range = 5 - 203 beds) per LTCF and the median number of beds in privately-owned (n=59) and voluntary (n=53) LTCF was higher than that in HSE-owned LTCF (n=38).

Overall, the median bed occupancy was 94% and the median single room occupancy was 34%. However, there were striking differences in single room availability based on ownership, with much lower proportions of single room availability in HSE-owned (21% of residents) versus LTCF under voluntary (50% of residents) and private (76% of residents) ownership.

Information was also captured on the proportion of LTCF residents who were absent on the survey date due to hospital admission. On average, 2.4% of residents were absent due to hospitalisation.

Table 3.1.3 Breakdown of participating LTCF, by ownership and care type.

Category	Number of LTCFs	Size of the facility			Total residents surveyed	Median proportion of single rooms available	Median percentage of beds occupied	Percentage of residents hospitalised
	n	median	min	max	n	%	%	%
by Ownership								
HSE	128	38	5	186	5,622	21	93	0.9
by HSE Region								
South	38	44	16	137	1,872	18	100	0.6
West	42	30	9	142	1,512	21	100	1.3
Dublin Mid Leinster	23	51	27	166	1,290	21	100	1.1
Dublin North East	25	26	5	186	948	24	100	0.7
Private	39	59	20	203	2,536	76	96	1.5
Voluntary	23	53	10	141	1,160	50	95	0.6
by Care Type								
General nursing > 12 months	103	51	21	203	5,807	35	95	1.2
Mixed > 12 months	26	47	13	142	1,409	32	94	1.1
Intellectually disabled	24	34	5	137	1,060	56	98	0.6
LTCFs < 12 months	15	29	12	78	374	15	89	0.5
Psychiatric	11	25	12	110	345	24	92	0.3
Palliative care	4	24	12	46	89	43	88	0.0
Physically disabled	2	28	22	34	46	14	82	0.0
Rehabilitation	3	64	35	72	139	14	93	0.0
Other	2	31	29	32	49	34	88	2.0
National	**190**	**46**	**5**	**203**	**9,318**	**34**	**94**	**2.4**

1.1.2 Governance Structures

1.1.2.1 Provision of Nursing & Medical Care

Availability of 24-hour qualified nursing care is a prerequisite for participation in the HALT survey. In the majority of units (n= 181, 95%), nursing staff had direct access to residents' healthcare records. For the remaining 5%, this information was not provided.

A variety of models of medical care exist in Irish LTCF, as displayed in Figure 3.1.2. Care was provided by the resident's own GP in 35%, a directly-employed doctor in 41% and in the remaining 24%, a mixed care model was observed, with both GPs and directly-employed doctors providing medical care.

Regional differences were also observed within HSE-owned LTCF, with GP-led care predominant in the West (64%) and much less common in the South (13%) and Dublin-North-East (20%). Notably, the distribution of care types was similar across the regions.

Differences were also observed based on LTCF ownership (GP-led care predominating in 82% of privately-owned versus 22% in those under voluntary ownership) and by care type (GN>12m were more likely to have directly employed doctors than Mixed>12m; 40% versus 23%) as displayed in Figure 3.1.3.

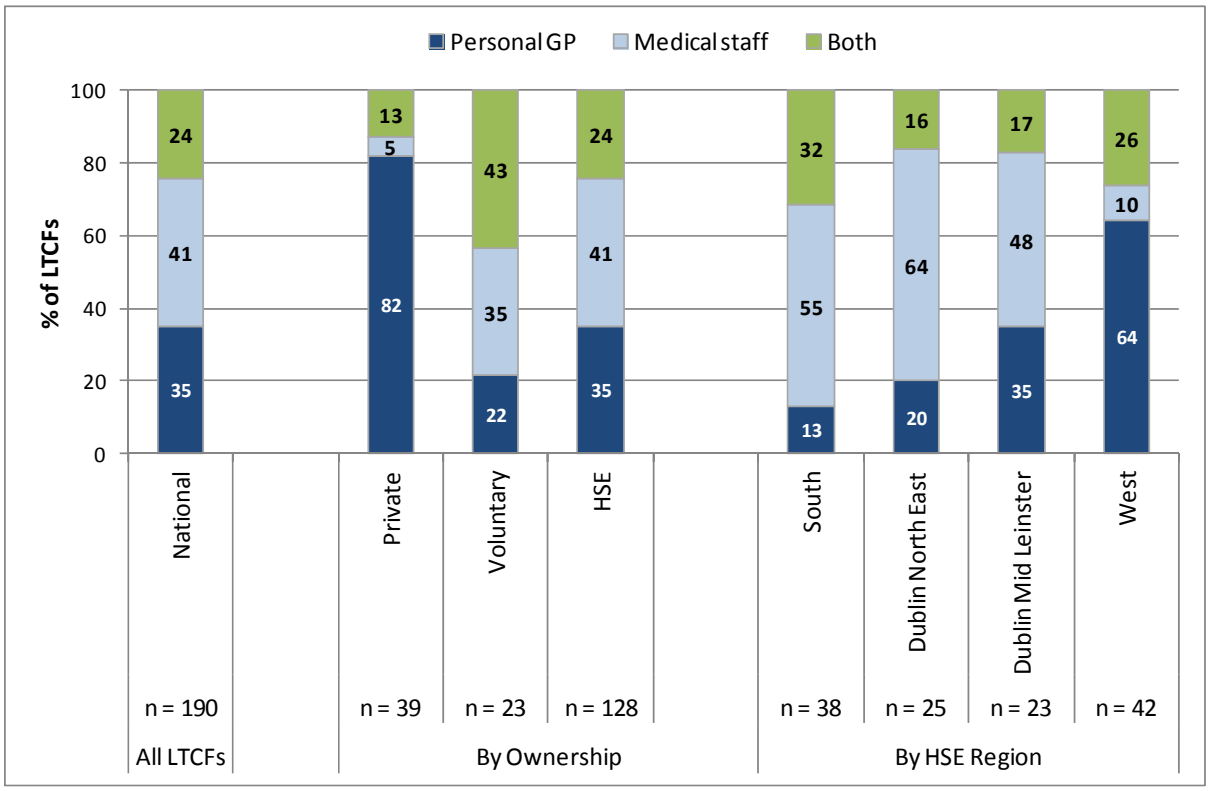

Figure 3.1.2 Models of medical care provision in LTCF, by ownership type and HSE region (for HSE-owned facilities)

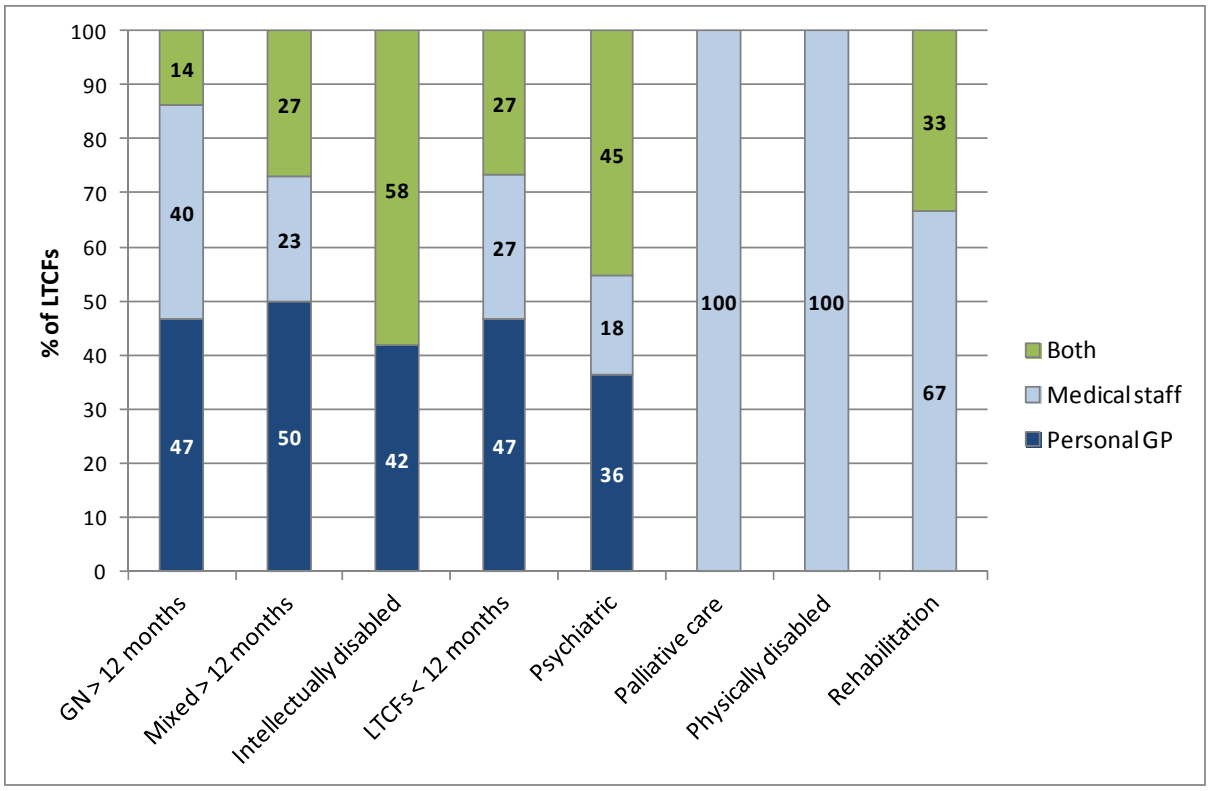

Figure 3.1.3 Models of medical care provision in LTCF, by care type

1.1.2.2 Coordination of Medical Care

Participants were asked to provide information regarding the coordination of medical care within the facility. This was defined as having a designated 'coordinating physician' to arrange medical activities and take responsibility for standardisation of practices/policies for resident care. Figure 3.1.4 displays the coordination of medical care.

Overall, 55% reported having no coordinating physician and this was higher in privately-owned LTCF (74%). For the 45% with a coordinating physician, a variety of models of care were delivered [internal (20%), external (18%) or a mixture of both (2%)].

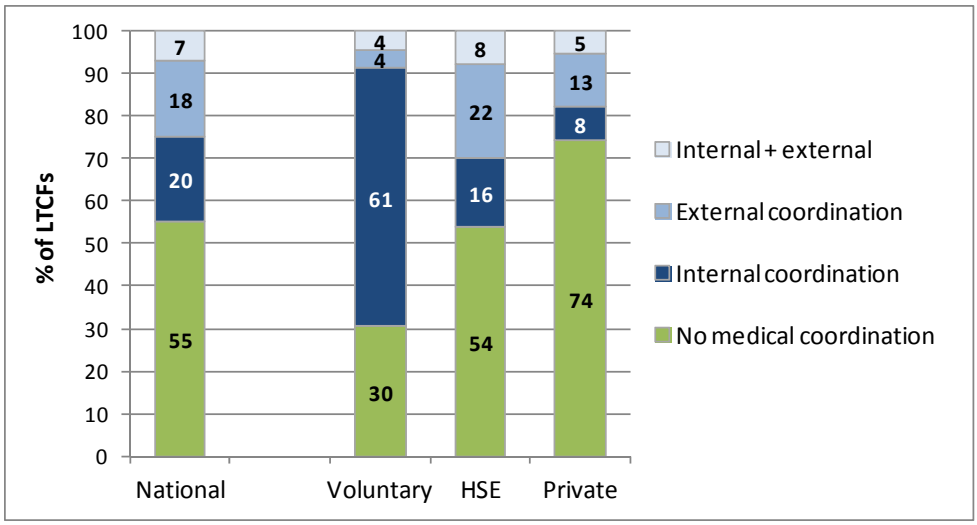

Figure 3.1.4 Coordination of medical care, by LTCF ownership.

Differences in coordination of medical care were also observed when facilities were stratified by care type (Figure 3.1.5). Absence of a nominated coordinating physician was more common in both GN>12m and Mixed>12m categories (>60%), whereas a coordinating physician was present in all of the palliative care, rehabilitation and physically disabled LTCF.

As the largest care type, availability of a coordinating physician in GN>12m was analysed, based on ownership. Absence of a coordinating physician was significantly more common in private (78%) than HSE (53%) GN>12m [p=0.02].

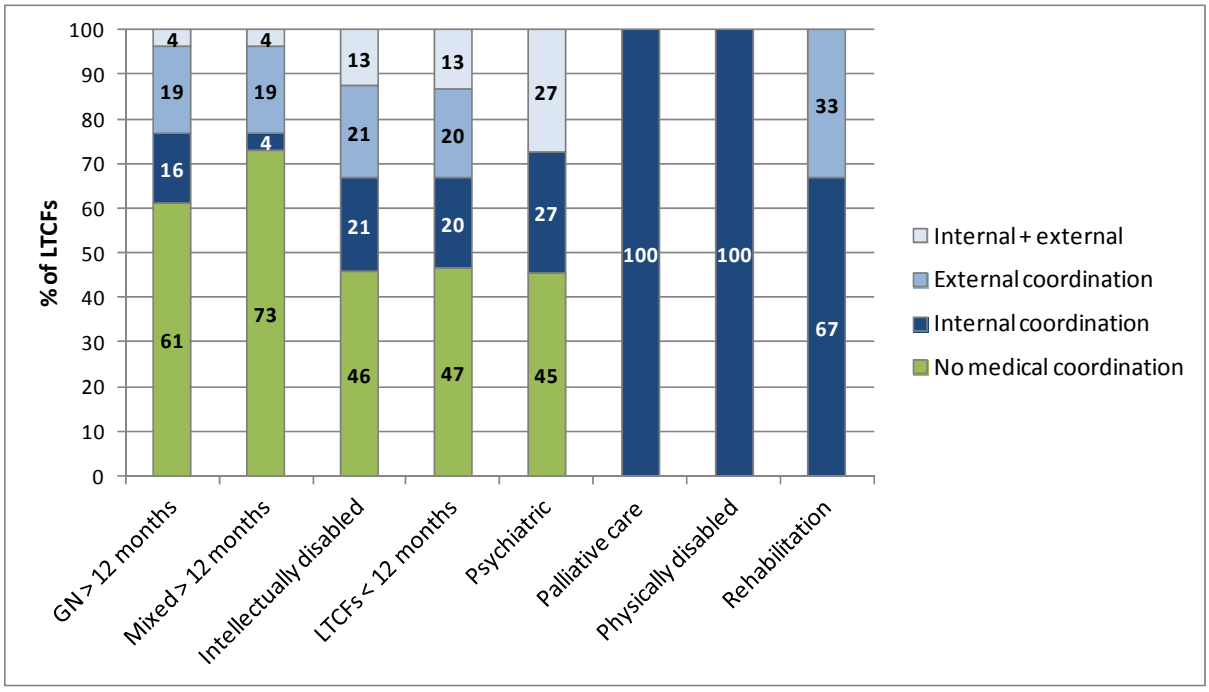

Figure 3.1.5 Coordination of medical care, by care type.

For the 85 (45%) LTCF with a designated coordinating physician (whether internal, external or a combination of both), retrospective additional information was sought on the job title of the coordinating physician. Of the facilities that responded (n = 60), the majority of coordinating physicians were either a directly-employed doctor (n = 24, 28%) or a designated GP (n = 20, 24%). Other titles included a hospital specialist [e.g., geriatrician] (n = 12, 14%), a medical doctor who owned the facility (n = 1, 1%) or another type of medical doctor (n = 3, 4%). For the remaining 25 LTCF, the job title of the coordinating physician was not provided. Figure 3.1.6 displays a breakdown of the coordinating physician job title, by care type.

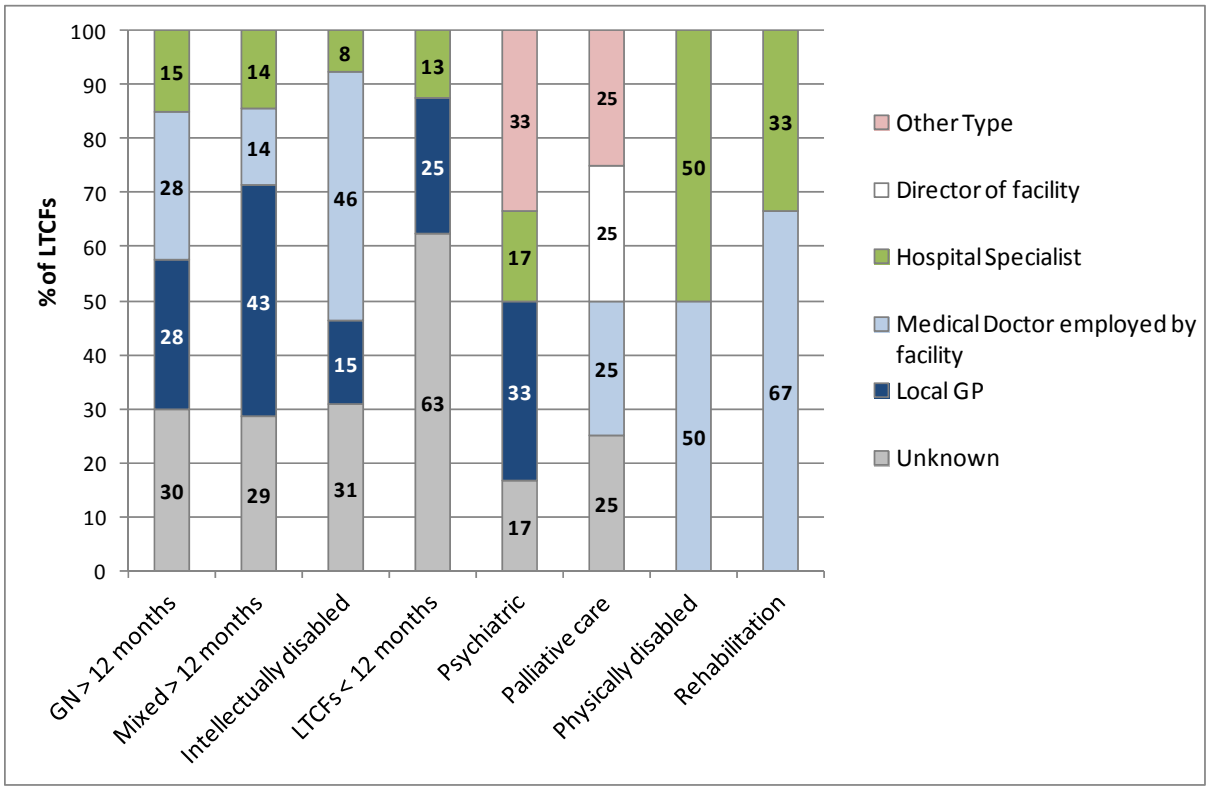

Figure 3.1.6 Type of coordinating physican, by LTCF type.

In 98% (n = 83) of LTCF with a coordinating physician, that person also delivered medical care to the residents and in the majority (96%), the coordinating physician had direct access to residents' healthcare records. In one LTCF direct access to records was not available and for two LTCF this was not reported.

Further information was sought on the duties performed by the coordinating physician. Figure 3.1.7 displays the frequency and variety of tasks undertaken. Frequently-reported duties were; organisation of an on-call service, coordination of resident vaccination, supervision of medical

records and care strategy development. The coordinating physician was less frequently reported to undertake roles specific to prevention of HCAI and antimicrobial resistance, such as development of IPC (16%) or antimicrobial prescribing (14%) policies.

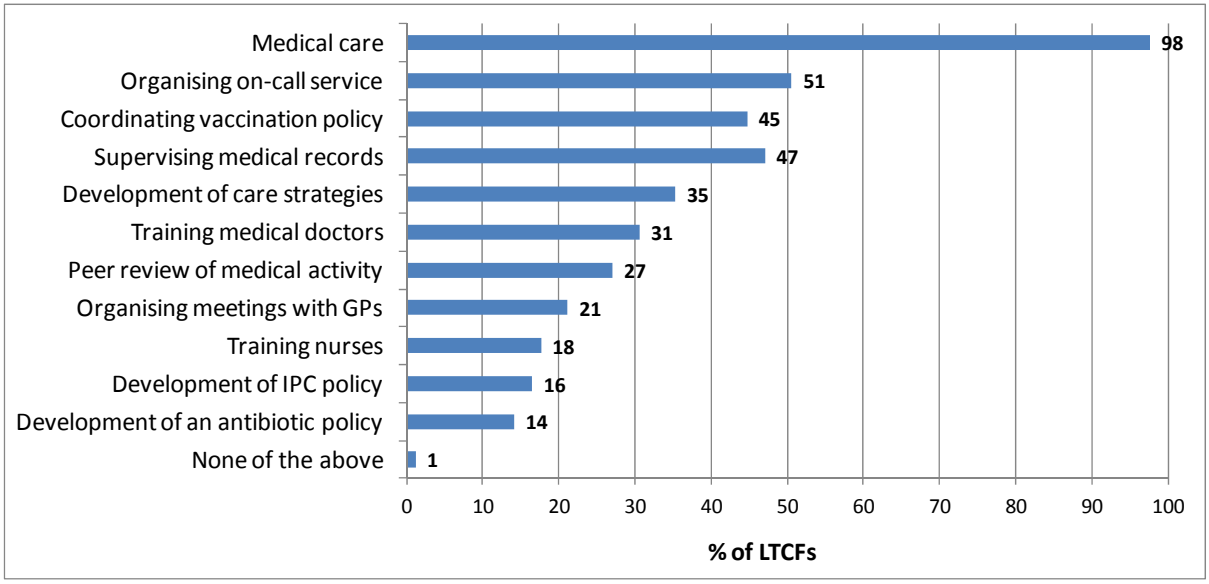

Figure 3.1.7 Duties performed by the coordinating physician.

1.1.2.3 Infection Prevention & Control (IPC) Practices

Tables 3.1.4 & 3.1.5 display the IPC structures, educational practices, protocols, surveillance and additional activities. Further description of these categories is provided subsequently.

Table 3.1.4 Overview of IPC structures, education and protocols, by ownership and care type.

	IPC Structure			IPC Education			IPC Protocols				
	Staff with IPC training	Expert IPC advice	IPC committee	Hand hygiene training	IPC training of nursing/paramedical staff	IPC training of GPs/medical staff	MRSA	Hand hygiene	Management of urinary catheters	Mangement of vascular catheters	Mangement of enteral feeding
	%			%			%				
by Ownership type											
Private (n = 39)	10	51	46	90	95	10	100	97	92	23	87
Voluntary (n = 23)	61	61	61	70	87	30	87	96	57	48	78
HSE (n = 128)	77	65	75	91	84	13	99	98	91	56	87
by Care Type											
GN > 12 months (n = 103)	52	66	67	92	88	14	100	98	90	41	88
Private only (n = 32)	9	50	44	91	94	9	100	97	91	25	84
Voluntary only (n = 7)	57	86	71	86	100	57	100	100	86	43	71
HSE only (n = 64)	73	72	78	94	84	11	100	98	91	48	92
Mixed > 12 months (n = 26)	58	46	73	88	92	8	96	96	88	50	92
Intellectually disabled (n = 24)	71	54	75	71	79	4	92	100	79	50	83
LTCFs < 12 months (n = 15)	87	73	67	93	80	20	100	100	100	73	93
Psychiatric (n = 11)	73	64	36	73	64	9	91	82	73	27	36
Palliative care (n = 4)	100	75	50	100	100	50	100	100	75	100	75
Physically Disabled (n = 2)	100	0	100	100	100	50	100	100	100	100	100
Rehabilitation (n = 3)	100	67	67	100	100	67	100	100	67	100	100
National	**62**	**62**	**67**	**88**	**86**	**14**	**98**	**97**	**87**	**48**	**86**

Table 3.1.5 Overview of IPC surveillance and general activities, by ownership and care type.

	Surveillance				General IPC activities					
	HCAI surveillance	Performing audits on IPC policies and procedures	Feedback of surveillance results to staff	Monitoring incidence of MDROs	Offering influenza immunisation to residents	Management of outbreaks	Organisation, control and feedback on hand hygiene	Decisions on transmission-based precautions for residents	Development of care protocols	Supervision of disinfection/sterilisation
	%				%					
by Ownership type										
Private (n = 39)	36	62	49	54	97	92	72	82	82	62
Voluntary (n = 23)	39	65	61	30	78	87	70	70	78	48
HSE (n = 128)	35	55	56	57	95	83	85	80	77	59
by Care Type										
GN > 12 months (n = 103)	37	53	55	53	97	87	79	83	80	61
Private only (n = 32)	41	59	53	56	97	94	69	84	78	63
Voluntary only (n = 7)	57	57	57	43	100	100	43	86	57	71
HSE only (n = 64)	33	50	56	53	97	83	88	83	83	59
Mixed > 12 months (n = 26)	42	69	54	62	96	88	92	81	88	65
Intellectually disabled (n = 24)	21	71	50	46	92	79	75	58	75	42
LTCFs < 12 months (n = 15)	40	60	53	60	100	80	87	73	73	53
Psychiatric (n = 11)	18	9	27	45	82	73	55	64	45	45
Palliative care (n = 4)	50	75	100	25	25	75	100	100	100	75
Physically Disabled (n = 2)	100	100	100	100	100	100	100	100	100	50
Rehabilitation (n = 3)	33	67	100	33	67	100	100	100	67	67
National	**36**	**57**	**55**	**53**	**94**	**85**	**81**	**79**	**78**	**58**

MDROs: Multi-drug resistant organisms

1.1.2.3.1 Staff with Training in IPC & Access to Advice from External IPC Experts

Overall, 117 (62%) LTCF reported access to a staff member with IPC training. However, LTCF under HSE or voluntary services ownership were more likely to have access to staff with IPC training (77% and 61%, respectively) than LTCF under private ownership (10%).

Of the 117 LTCF reporting a staff member with IPC training, for 83 (71%), that person was not based within the LTCF on a day-to-day basis, for 27 (23%) that person was based within the LTCF on an ongoing basis and for seven (6%) that person attended the LTCF on a sessional basis. Where a staff member with IPC training was available, for the majority of LTCF, that person was a nurse (n=109; 93%). Seven LTCF (6%) reported having both a nurse and a doctor with IPC training and one LTCF (1%) reported having a doctor with IPC training. Four LTCF were governed by an acute hospital. Thus, for those LTCF, the IPC service was provided by the acute hospital's IPC team.

There was considerable geographic variability in the proportion of LTCF beds with access to an IPCN when distributed by county (range: 0 – 100%), as displayed in Figure 3.1.8.

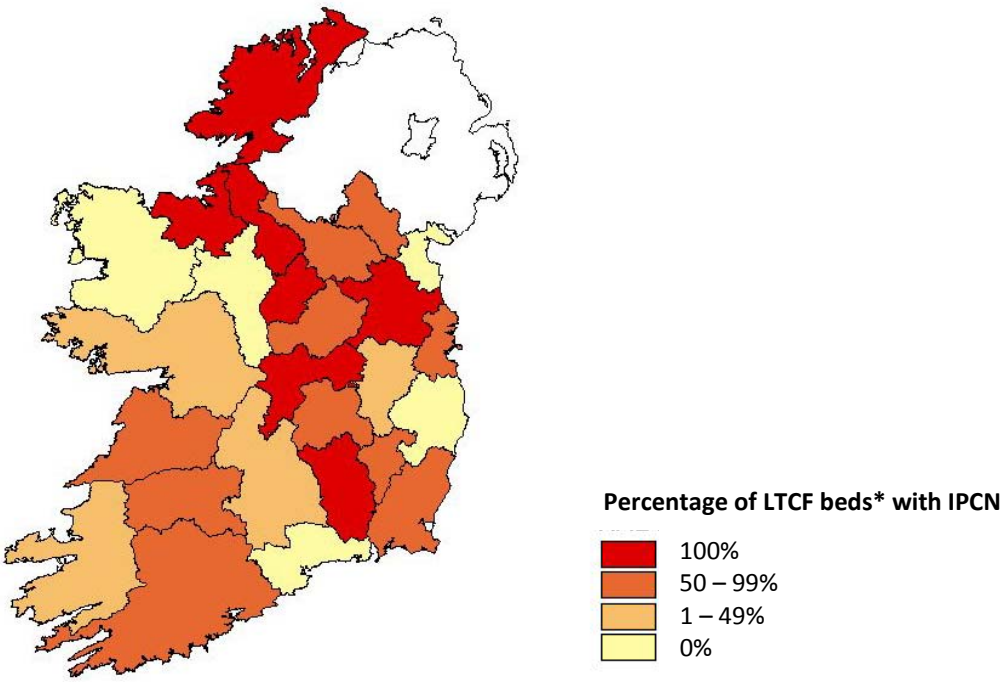

Figure 3.1.8 Geographical distribution of the proportion of participating LTCF beds covered by IPCNs.

* Includes LTCF beds that participated in HALT only

A total of 36 IPCNs were available to participating LTCF. Excluding the four IPCNs attached to LTCF governed by acute hospitals, the estimated overall WTE ratio of IPCNs to LTCF beds in Ireland was 1:496. This ratio was calculated by including all LTCF beds that the IPCN was responsible for, which included both participating and non-participating HALT LTCF.

In HSE-owned LTCF, the estimated ratio of WTE IPCNs to LTCF beds was highest in HSE South and West (1:673 and 1:659) when compared to Dublin-mid-Leinster and Dublin-North-East (1:387 and 1:354) (Table 3.1.6).

Table 3.1.6 Ratio of WTE IPCN per HSE-owned LTCF, by HSE region.

HSE Region	Number of HSE LTCFs that participated	Number of facilities with an IPCN	WTE ratio[a]
Dublin Mid Leinster	22	14	1:387
Dublin North East	24	20	1:354
South	36	24	1:673
West	42	37	1:659

[a] The whole time equivalent (WTE) ratio per HSE region was calculated by dividing the total number of HSE beds that IPCNs* within that region are responsible for by the total WTE associated with those IPCNs.

In addition to having access to staff with IPC training, information was sought on access to external expert IPC advice. Overall, 117 LTCF (62%) reported having access to such advice, no access was reported by two LTCF caring for residents with physical disability, and less access for LTCF caring for intellectually disabled (54%) and Mixed>12m (46%).

1.1.2.3.2 Infection Prevention and Control Committee (IPCC)

Just over two-thirds reported having an active local IPCC, with a median number of three meetings per year (range = 0 – 15). Psychiatric (36%) and palliative care facilities (50%) were less likely to have an IPCC.

1.1.2.3.3 Hand Hygiene and Access to Personal Protective Equipment (PPE)

Hand Hygiene Training

Overall, 88% reported that a staff hand hygiene training session had been organised during the previous year. This figure was higher in GN>12m (92%) and LTCF<12m (93%) and lower in intellectually disabled (71%) and psychiatric (73%) LTCF.

Overall, there was variation in the staff categories invited to avail of annual hand hygiene training as displayed in Table 3.1.7. Nursing (100%) and hygiene services staff (92%) were most likely to be invited and medical (27%) and allied health professional (28%) staff were less likely to be invited. By category of ownership, medical and allied health staff were less likely to be invited to attend hand hygiene training in privately-owned LTCF (11% and 14%, respectively) and more likely to be invited in facilities under voluntary ownership (both 53%).

Table 3.1.7 Staff categories invited to avail of annual hand hygiene education.

Ownership	Medical staff	Nurses and care assistants	Allied health staff*	Hygiene services staff
	%	%	%	%
Private	11	100	14	92
HSE	28	100	28	93
Voluntary	53	100	53	80
National	**27**	**100**	**28**	**92**

* physiotherapist, occupational therapist, speech therapist etc

Access to hand hygiene products

The vast majority of LTCF reported having both alcohol-based hand rub (ABHR) and liquid soap (both 97%) as hand hygiene products (Table 3.1.8). Alcohol-based wipes were reported to be available in 41% of LTCF. ABHR was reported as the preferred hand hygiene method in 53% and the average estimated volume of ABHR consumed during the previous year (2012) was 118 litres. For 36% of LTCF, hand washing with a non-antiseptic soap was the preferred method and for 10% antiseptic soap was the preferred method.

Table 3.1.8 Availability of hand hygiene products and preferred hand hygiene methods.

Hand hygiene products/methods	% of LTCFs
Product	
Alcohol rub	97
Liquid soap	97
Wipes	41
Bar soap	0
Method	
Hand disinfection with an alcohol solution	53
Hand washing with water and a non antiseptic soap	36
Hand washing with water and an antiseptic soap	10

Access to personal protective equipment (PPE)

All reported having both gloves and aprons available for healthcare worker PPE. Gowns were available in 99%, surgical masks in 88% and goggles in 66% of LTCF.

1.1.2.3.4 Availability of Written Protocols

Information regarding the availability of written protocols for staff on the following topics was sought (Table 3.1.4):

- *Management of MRSA and other multi-drug resistant organisms (MDRO):* Available in 98% overall, with lower rates reported from psychiatric (91%) and intellectually disabled LTCF (92%)
- *Hand hygiene*: Available in 97% overall, with lower rates reported from psychiatric LTCF (82%)
- *Management of urinary catheters:* Available in 87% overall, with lower rates reported from rehabilitation (67%), psychiatric (73%) and palliative care facilities (75%)
- *Management of vascular catheters:* Available in 48% overall, with higher rates from palliative care (100%) and rehabilitation (100%) and lower rates reported from Mixed>12m and intellectually disabled LTCF (both 50%)
- *Management of enteral feeding:* Available in 86% overall, with higher rates from LTCF<12m (93%), Mixed>12m (92%) and lower rates reported from psychiatric LTCF (36%)

1.1.2.3.5 HCAI Surveillance Programme

- Some form of a HCAI surveillance programme was reported by 36% (n=68) of LTCF (Table 3.1.5). Ongoing participation in repeated HALT surveys could be regarded as an annual HCAI surveillance programme. Some care types were more likely to report having HCAI surveillance activities; palliative care (50%) and Mixed>12m (42%). Lower levels were reported from rehabilitation (33%), intellectually disabled (21%) and psychiatric (18%) LTCF
- Overall, just over half reported that audits of IPC policies and procedures are conducted (57%), that surveillance results are fed back to staff (55%) and that the incidence of MRDO is monitored (53%)
- Notably, facilities with an active IPCC were much more likely to report having MDRO surveillance programmes than those without
- A designated staff member for reporting and management of infection outbreaks was available in 85% overall, with lower levels reported from psychiatric (73%) and palliative care (75%) LTCF
- A system in place for the organisation, control and feedback on hand hygiene was available in 81% overall, with lower levels reported from psychiatric (55%) and intellectually disabled (75%) LTCF
- A system for management of patients with resistant organisms (e.g., patient isolation, additional IPC precautions) was available in 79% overall, with less availability in intellectually disabled (58%), psychiatric (64%) and LTCF<12m (73%)
- Overall, a system for development of resident care protocols available in 78% and a system for supervision of disinfection/sterilisation of medical equipment in only 58% of LTCF
- Overall, the majority (94%) reported that seasonal influenza vaccine is offered to residents. However, lower figures were reported from rehabilitation (67%) and psychiatric (82%) LTCF

1.1.2.4 Antimicrobial Stewardship Practices

Antimicrobial stewardship practices, stratified by LTCF ownership, care type and presence of a designated coordinating physician are displayed in Table 3.1.9.

Table 3.1.9 Antimicrobial stewardship practices, by LTCF ownership, care type and presence of a coordinating physician.

	Antimicrobial stewardship committee	Training of prescribers on antimicrobial use	Guidelines for appropriate antimicrobial use	Data about antimicrobial consumption	Microbiological samples taken before antimicrobials	Local antimicrobial resistance profile summaries	Permission for prescribing restrictived antimicrobials	Pharmacist giving advice on antimicrobial use	Therapeutic formulary available	Feedback to GPs on antimicrobial consumption
	%									
by Ownership type										
Private (n = 39)	0	5	28	13	21	13	0	44	21	10
Voluntary (n = 23)	13	22	43	22	22	13	0	43	39	9
HSE (n = 128)	5	2	31	11	17	4	6	27	37	10
by Care Type										
GN > 12 months (n = 103)	6	4	28	16	19	8	5	39	33	13
Private only (n = 32)	0	6	22	16	25	16	0	44	25	13
Voluntary only (n = 7)	14	14	43	29	29	14	0	29	14	14
HSE only (n = 64)	8	2	30	14	16	3	8	38	39	13
Mixed > 12 months (n = 26)	0	0	54	8	19	8	0	27	35	12
Intellectually disabled (n = 24)	8	13	17	8	21	4	0	17	38	8
LTCFs < 12 months (n = 15)	0	0	40	13	27	0	13	20	27	7
Psychiatric (n = 11)	0	0	9	0	0	0	0	18	9	0
Palliative care (n = 4)	0	25	100	25	0	25	0	100	75	0
Physically disabled (n = 2)	0	0	0	0	0	0	0	0	100	0
Rehabilitation (n = 3)	0	0	67	0	0	0	0	33	0	0
by Presence of a Coordinating Physician										
With a CP	**9**	8	**41**	**20**	19	9	**8**	40	41	13
Without a CP	**1**	2	**25**	**7**	18	5	**1**	27	28	8
Chi-test (p-value)	**0.02**	0.052	**0.02**	**0.01**	0.9	0.2	**0.02**	0.54	0.052	0.24
National	**5**	**5**	**32**	**13**	**18**	**7**	**4**	**33**	**34**	**10**

* Chi-test p-values that reached significance are highlighted in bold

1.1.2.4.1 Overview of Antimicrobial Stewardship Practices & Guidelines

- The vast majority (95%) reported having no antimicrobial stewardship committee (ASC). Of the nine LTCF with an ASC (5%), none were privately-owned
- Additionally, the vast majority (95%) reported that annual training on antimicrobial prescribing was not provided
- Just under one third (32%) reported having a local antimicrobial prescribing guideline, with less availability reported by psychiatric (9%), intellectually disabled (17%) and GN>12m (28%). Prescribing guidelines were more likely to be available in palliative care (100%), rehabilitation (67%) and Mixed>12m (54%) facilities
- The vast majority (88%) reported having no restrictions on the types of antimicrobials that could be prescribed for residents. Of the 22 that reported having a restricted antimicrobial list, the types of restricted antimicrobials are displayed in Table 3.1.10

Table 3.1.10 Types of restricted antimicrobials.

Restricted antimicrobials	Number of LTCFs (%)
3rd generation cephalosporins	15 (68)
carbapenems	14 (64)
vancomycin	13 (59)
fluoroquinolones	8 (36)
intravenous antimicrobials	8 (36)
broad-spectrum antibiotics	6 (27)
glycopeptides	5 (23)
mupirocin	3 (14)
Total	**22 (100)**

- One-third reported having access to the advice of a pharmacist as required, if residents were prescribed unusual antimicrobials, with more access reported by LTCF under private (44%) or voluntary (43%) ownership
- Local antimicrobial consumption data was collected by the minority (13%), such data was reported back to GPs by a minority (10%) and a minority (7%) reported having access to summary reports of antimicrobial resistance in key pathogens from their local microbiology laboratory
- A minority (18%) reported having a system in place to remind staff of the importance of obtaining relevant clinical specimens from the resident prior to commencing antimicrobial

therapy (e.g., the importance of taking a urine specimen before starting treatment for a suspected UTI)

- Information was sought regarding the frequency with which a urine dipstick test was used for UTI diagnosis. Of the 186 (98%) who answered, urine dipstick was performed routinely in 146 (78%), on occasion in 39 (21%) and never in one LTCF (1%)
- Specific information was also sought on the availability of local antimicrobial prescribing guidelines for three common infection types, as displayed in Table 3.1.11:
    - RTI (35%)
    - UTI (43%)
    - Wound/skin or soft tissue infection (43%)

Table 3.1.11 Written antimicrobial treatment guidelines.

	Antimicrobial treatment guidelines		
	Respiratory tract infections	Urinary tract infections	Wound and soft tissue infections
by Ownership			
Private	26	42	39
HSE	36	41	42
Voluntary	45	55	55
by Presence of a Coordinating Physician			
With a CP	46	50	51
Without a CP	27	37	37
National	**35**	**43**	**43**

- When LTCF were stratified by the presence or absence of a coordinating physician, the presence of a coordinating physician was significantly associated with a higher prevalence of positive antimicrobial stewardship practices, in particular the existence of an ASC, antimicrobial prescribing guidelines, restrictive prescribing policies and antimicrobial consumption data

1.1.3 HCAI and Antimicrobial Use

1.1.3.1 Description of Residents

Table 3.1.12 displays an overview of the resident demographics, care load indicators and HCAI risk factors, by care type. Female residents predominated across all care types. There was a much higher proportion of residents aged ≥85 years in; GN>12m, Mixed>12m, LTCF<12m and rehabilitation LTCF.

Care load indicators (incontinence, disorientation and impaired mobility) were evident but varied across all care types. Overall, there was a heavy burden of all care load indicators in GN>12m, Mixed>12m and LTCF<12m.

HCAI risk factors were most prevalent in palliative care, where urinary and vascular catheters and 'other wounds' were much more common than for other care types. Overall, recent surgery within the past 30 days was uncommon in residents, with rehabilitation (5%) and LTCF<12m (4%) more likely to accommodate those resident types. Residents of psychiatric LTCF were less likely to have HCAI risk factors.

Table 3.1.12 Resident demographics, care load indicators and HCAI risk factors, by care type.

Facility Type	Gender	Age	Care load indicators			HCAI Risk factors				
	male residents	resident >85 years	incontinence	disorientation	impaired mobility	urinary catheter	vascular catheter	pressure sores	other wounds	surgery (<30 days)
	%									
GN > 12 months	35	47	62	57	48	5	0	4	10	1
Mixed > 12 months	39	41	65	54	54	8	1	4	11	3
LTCFs < 12 months	36	38	45	33	40	14	1	8	11	4
Intellectually disabled	45	1	52	54	33	3	0	1	9	0
Psychiatric	48	10	43	29	23	2	1	2	2	1
Palliative care	44	9	27	26	60	31	10	9	36	1
Physically Disabled	48	9	78	59	74	7	0	0	2	0
Rehabilitation	40	29	22	17	21	8	2	1	15	5
Other	71	0	78	53	84	2	0	6	39	0
National	**37**	**38**	**59**	**53**	**46**	**6**	**0.5**	**4**	**11**	**1**

1.1.3.2 HCAI

The national median HCAI prevalence was 4.2%. Table 3.1.13 displays the HCAI prevalence, by care type. Similar to the distribution of HCAI risk factors, as displayed in Table 3.1.12 above, the median prevalence of HCAI was highest in palliative care (18%) and lowest in intellectually disabled (2.2%) and physically disabled LTCF (no reported HCAI in 46 residents). Median HCAI prevalence was higher in rehabilitation (7.8%) and LTCF<12m (8.3%) than Mixed>12m (6.1%) and GN>12m (4.2%). The median HCAI prevalence in GN>12m and psychiatric LTCF was quite similar (4.2% and 4.3%).

Table 3.1.13 HCAI prevalence, by care type.

Facility Type	Total eligible residents	Number of residents with an infection	HCAI prevalence (%)	
			Crude[a]	Median (IQR[b])
GN > 12 months	5,807	294	5.1	4.2 (2 - 7)
Mixed > 12 months	1,409	86	6.1	6.1 (2.6 - 8.5)
Intellectually disabled	1,060	46	4.3	2.2 (0 - 6.8)
LTCFs < 12 months	374	28	7.5	8.3 (0.7 - 10.9)
Psychiatric	345	11	3.2	4.3 (0 - 6.5)
Rehabilitation	139	11	7.9	7.8 (6 - 11.3)
Palliative care	89	18	20.2	18.0 (14.1 - 21.8)
Physically disabled	46	0	0.0	0.0 (0 - 0)

[a] The crude prevalence of residents with a HCAI is the total number of residents with an infection divided by the total number of eligible residents.

[b] The interquartile range is the difference between the first quartile (25th percentile) and the third quartile (75th percentile) of an ordered range of data. It represents the middle fifty percent of the data.

HCAI Types

Figure 3.1.9 displays the prevalence of HCAI, by care type.

RTI

- Overall, RTI was the most prevalent HCAI, affecting 1.9% of all residents. RTI were further categorised into; lower RTI (68%), common cold (23%), pneumonia (8%) and flu (2%)
- RTI was the most prevalent (or one of the most prevalent) HCAI reported by Mixed>12m (2.3%), intellectually disabled (1.6%) and rehabilitation (2.9%) LTCF. RTI was less prevalent in psychiatric LTCF (0.9%)

UTI

- Overall, UTI was the second most prevalent HCAI, affecting 1.7% of all residents. In total, 33% were reported as microbiologically-confirmed UTI
- UTI was the most prevalent (or one of the most prevalent) HCAI, reported by LTCF<12m (3.2%), GN>12m (1.7%) and rehabilitation LTCF (2.9%). UTI was less prevalent in intellectually disabled (0.6%) and psychiatric LTCF (0.6%)

Skin infections

- Skin infections were the third most prevalent HCAI, affecting 1.3% of all residents. The vast majority were further categorised as cellulitis (94%)
- Skin infections were the most prevalent (or one of the most prevalent) HCAI reported by intellectually disabled (1.6%) and psychiatric LTCF (1.4%)

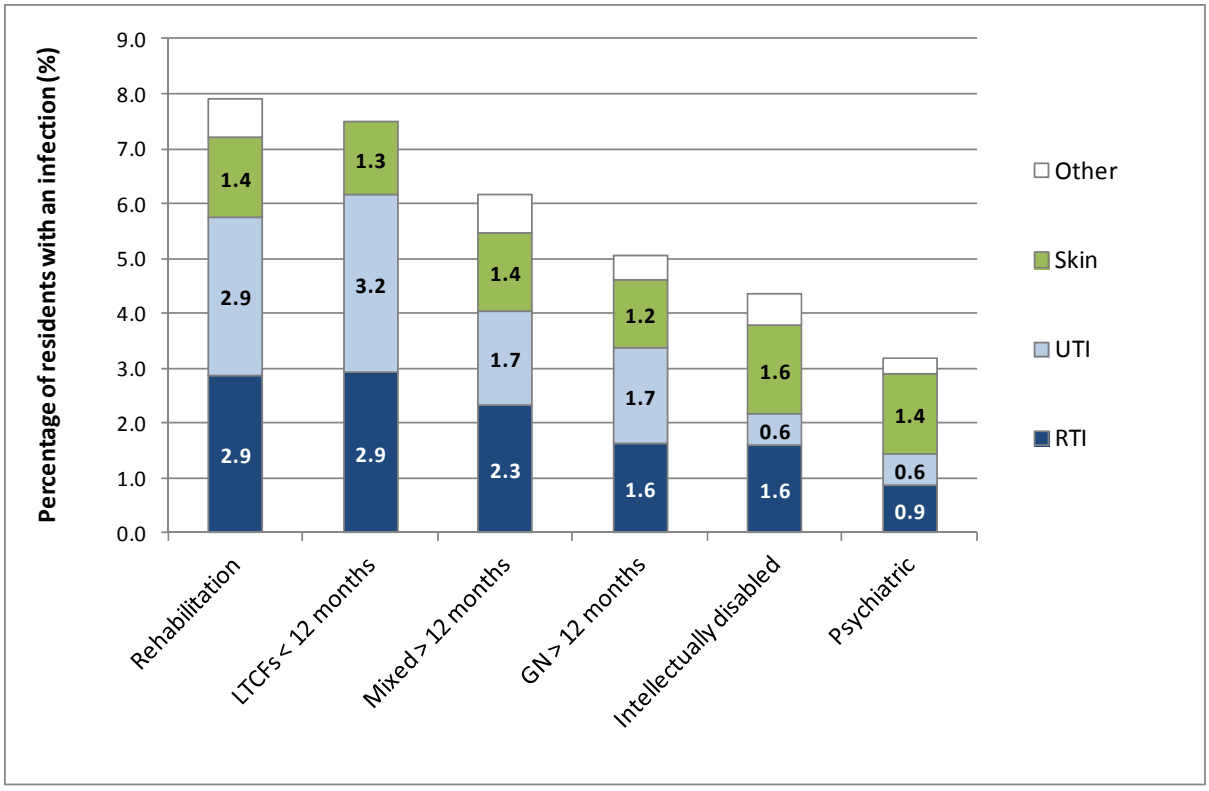

Figure 3.1.9 Prevalence of HCAI, by care type.

Only LTCF care types including > 100 eligible residents were included for this analysis

1.1.3.3 Antimicrobial Use

The national median antimicrobial use prevalence was 9.8%. Table 3.1.14 displays antimicrobial use prevalence, by care type. The median prevalence was highest in palliative care (24.5%) and Mixed>12m (11.2%) and lowest in psychiatric (4.7%) and physically disabled (no antimicrobials prescribed) LTCF.

Table 3.1.14 Antimicrobial use prevalence, by care type.

Facility Type	Total eligible residents	Number of residents on antimicrobials	Antimicrobial prevalence (%)	
			Crude	median (IQR)
GN > 12 months	5807	541	9.3	9.1 (5.7 - 13.3)
Mixed > 12 months	1409	149	10.6	11.2 (8.2 - 15.3)
Intellectually disabled	1060	106	10.0	7.5 (3.2 - 13.9)
LTCFs < 12 months	374	42	11.2	9.5 (5.5 - 16.7)
Psychiatric	345	23	6.7	4.7 (4.3 - 11.7)
Rehabilitation	139	14	10.1	9.4 (8.9 - 12.1)
Palliative care	89	31	34.8	24.5 (19.7 - 33)
Physically Disabled	46	0	0.0	0.0 (0 - 0)

Antimicrobial Prescribers and Prescribing Location

Across all care types, the vast majority of antimicrobials were prescribed within the LTCF (81%), as displayed in Figure 3.1.10. A higher proportion of antimicrobials were prescribed in the hospital setting in Mixed>12m (15%), intellectually disabled (14%), and palliative (18%) LTCF.

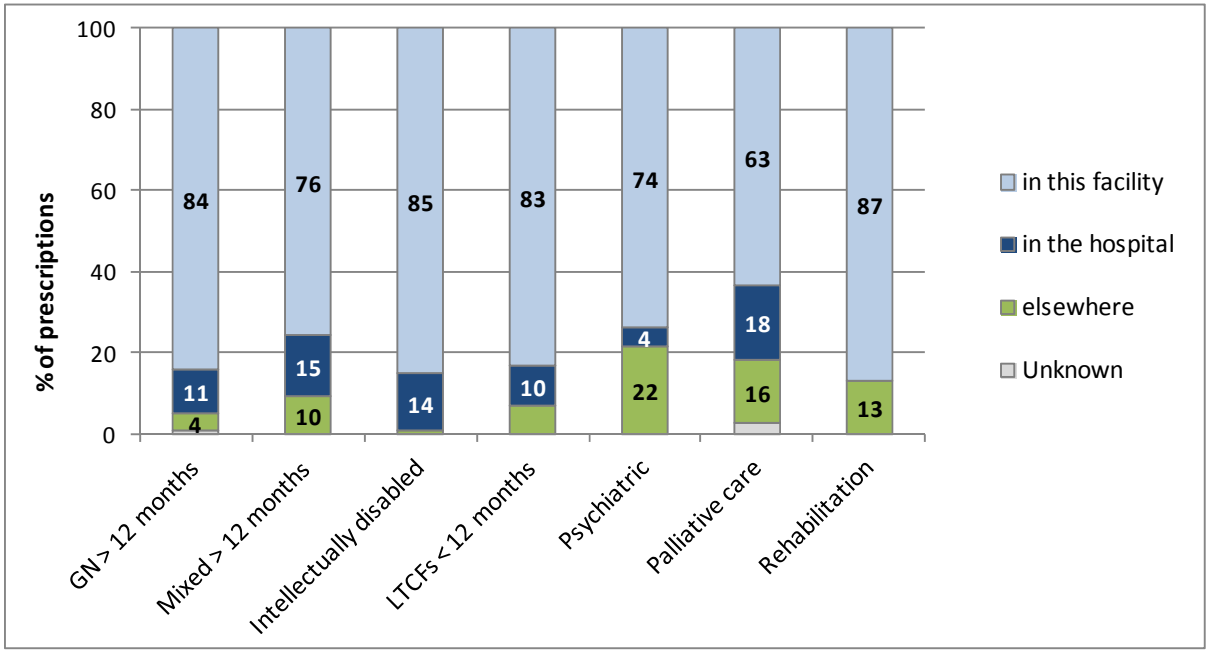

Figure 3.1.10 Antimicrobials, by prescribing location and care type.

Combined, GPs and directly-employed doctors accounted for the majority of prescribers across the care types, as displayed in Figure 3.1.11. Hospital-based specialists accounted for increasing proportions of antimicrobials in rehabilitation (33%) and palliative care (45%) LTCF.

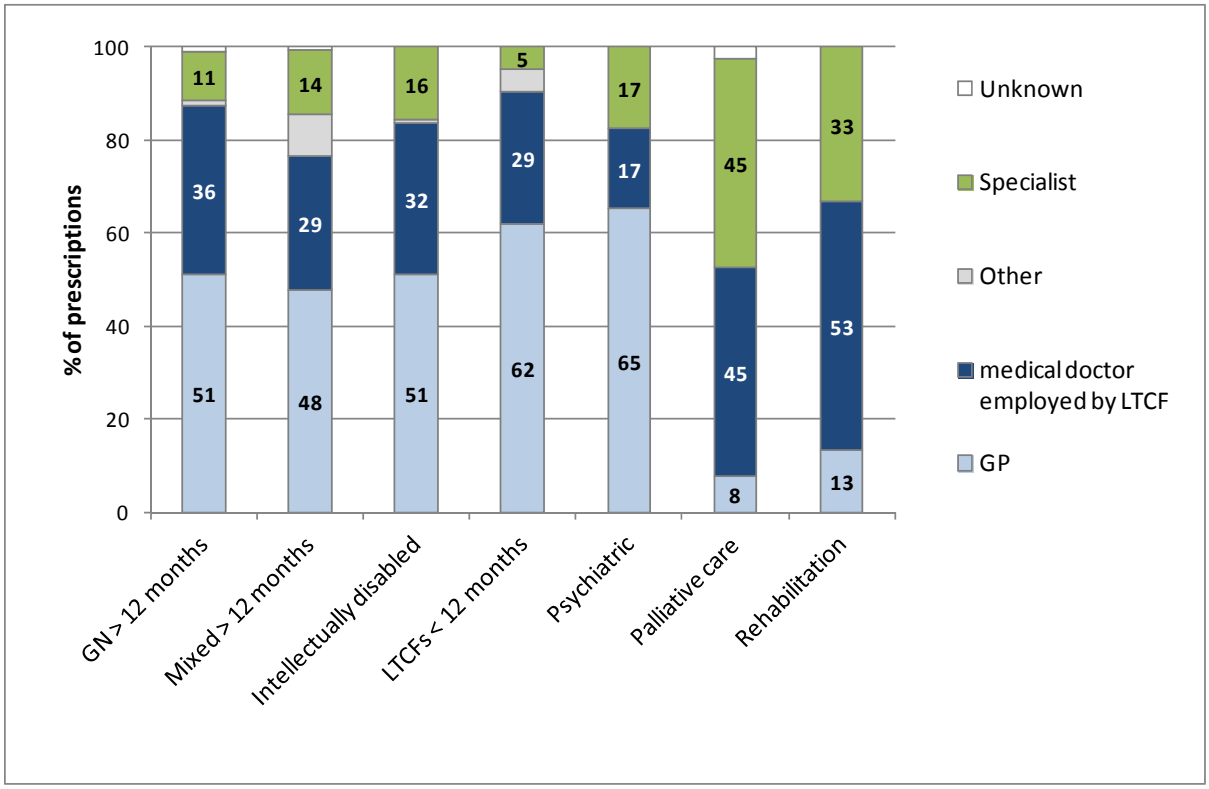

Figure 3.1.11 Antimicrobials, by prescriber and care type.

Reasons & Sites for which Antimicrobials were Prescribed

The reason for antimicrobials varied across care types, as displayed in Figure 3.1.12. Whilst the majority were for treatment of infection, the proportion prescribed for prophylaxis was highest in intellectually disabled (49%), GN>12m (39%) and Mixed>12m (35%) and lowest in LTCF<12m (17%) and rehabilitation (13%) LTCF.

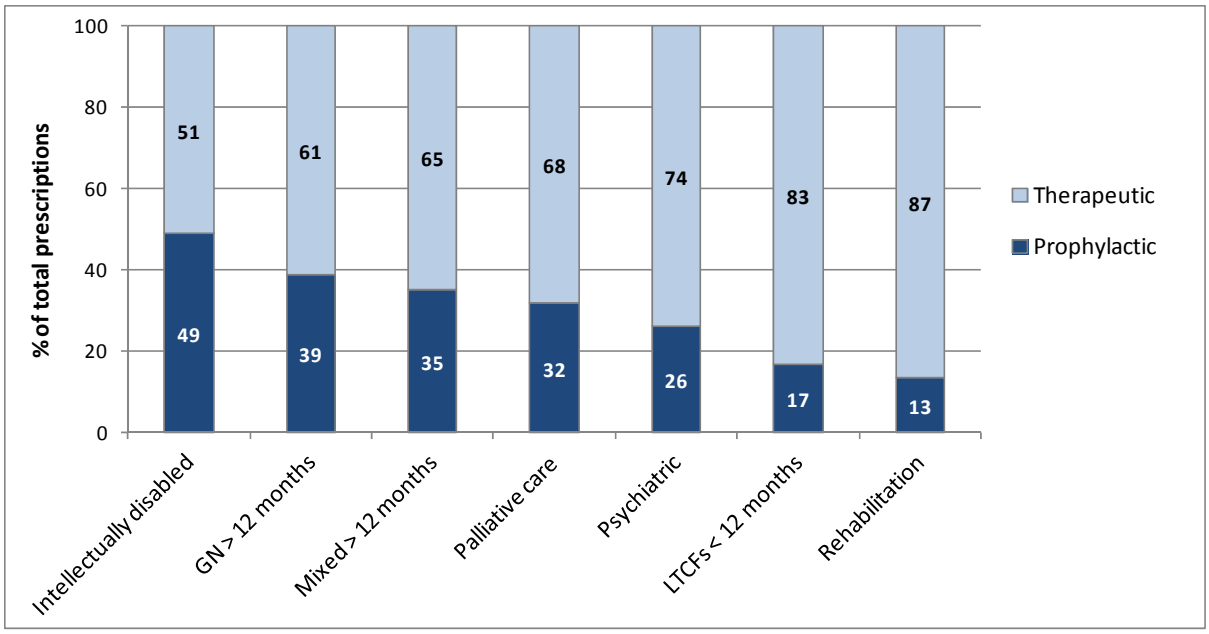

Figure 3.1.12 Reason for antimicrobials, by care type.

Figure 3.1.13 displays the antimicrobial use prevalence, by body site across the care types.

- The urinary tract was the most prevalent site, accounting for antimicrobials prescribed to 4.6% of all residents. GN>12m (5.1%), Mixed>12m and LTCF<12m (4.8% each) had a slightly higher prevalence, whilst intellectually disabled (2.6%) and psychiatric (2.3%) LTCF had a lower prevalence
- The respiratory tract was the second most prevalent site, accounting for antimicrobials prescribed to 2.9% of all residents. Intellectually disabled (3.9%), Mixed>12m (3.6%) and LTCF<12m (3.2%) had a higher prevalence, whilst psychiatric (2.3%) and GN>12m (2.4%) had a lower prevalence
- Skin or wounds were the third most prevalent site, accounting for antimicrobials prescribed to 1.6% of all residents. Intellectually disabled LTCF had a higher prevalence (3.1%) and GN>12m, Mixed>12m and rehabilitation LTCF had a lower prevalence (1.4% each)

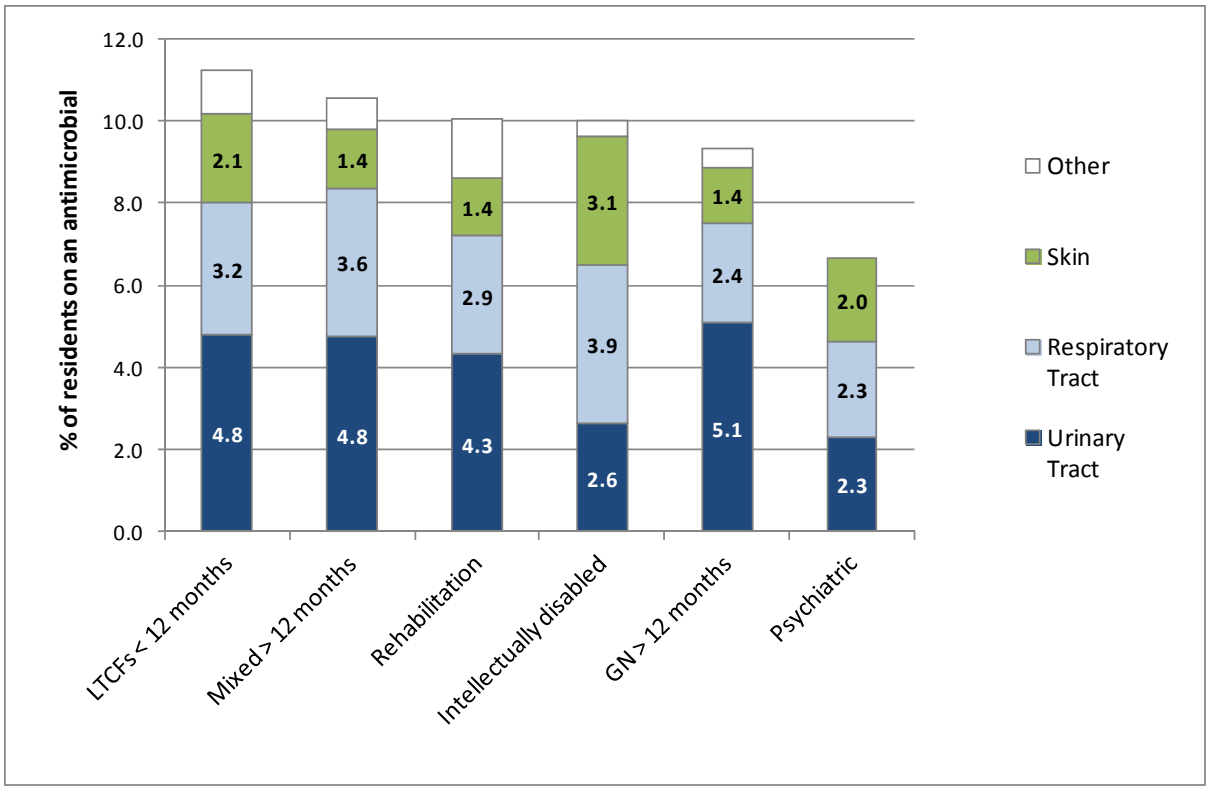

Figure 3.1.13 Prevalence of antimicrobial use, by body site and care type.

Only LTCF care types including > 100 eligible residents were included in this breakdown.

Figures 3.1.14 and 3.1.15 display the breakdown of antimicrobials for treatment and prophylaxis, by care type.

- Treatment of RTI and UTI were jointly the two most prevalent indications: LTCF<12m (3.2% each) and rehabilitation LTCF (2.9% each). UTI treatment was less prevalent in intellectually disabled (0.7%) and psychiatric LTCF (1.2%). Treatment of skin/wound infections was most prevalent in LTCF<12m (1.9%) and intellectually disabled LTCF (1.7%)
- UTI prevention was the most prevalent indication for antimicrobial prophylaxis (3.2% of GN>12m and 2.9% of Mixed>12m residents)
- Intellectually disabled LTCF had the highest prevalence of prophylaxis (5.3%), divided into urinary tract (2.0%), respiratory tract (1.9%) and skin/wound (1.4%) prophylaxis. Indeed, almost half of antimicrobials prescribed in intellectually disabled LTCF were for prevention of skin infection

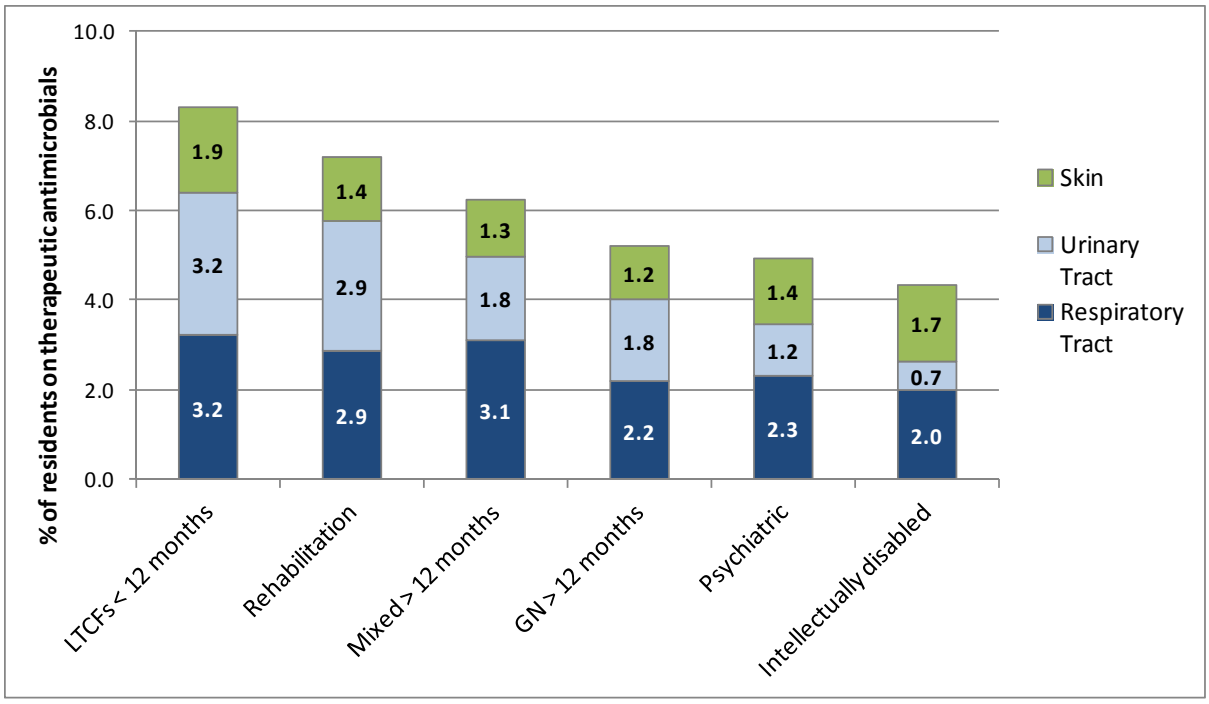

Figure 3.1.14 Body sites for treatment of infection, by care type.

Only LTCF care types including > 100 eligible residents were included in this breakdown.

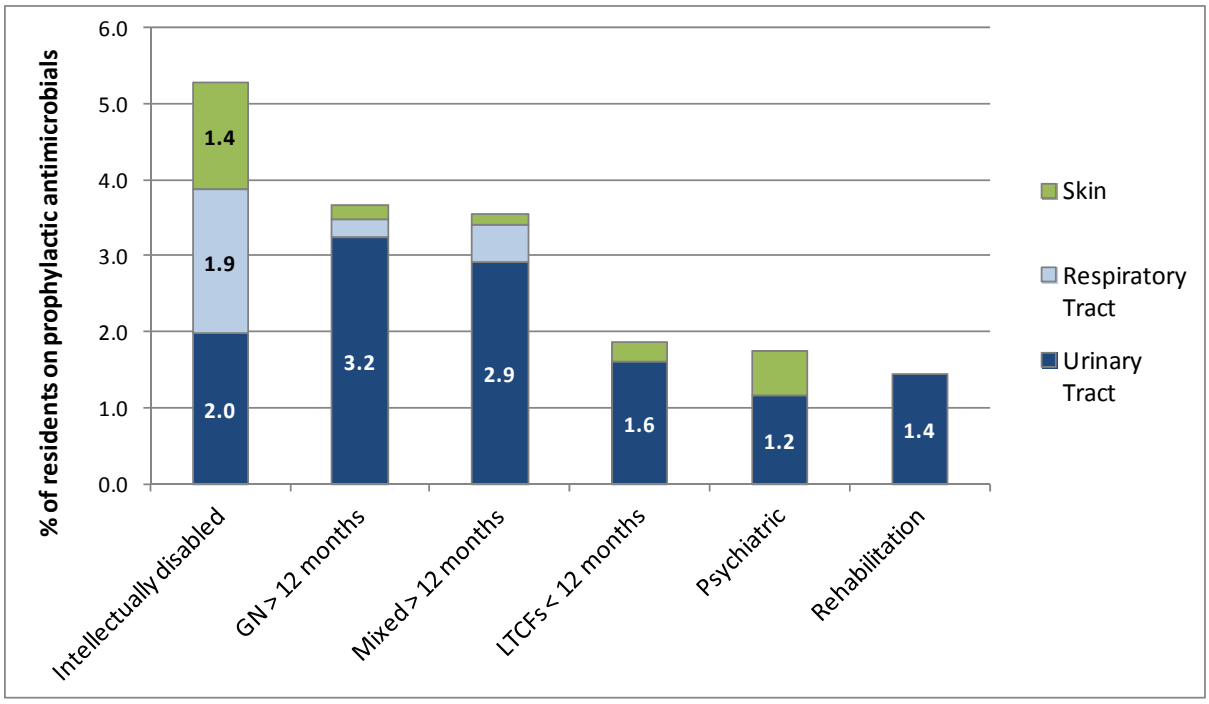

Figure 3.1.15 Body sites for prevention of infection (prophylaxis), by care type.

Only LTCF care types including > 100 eligible residents were included in this breakdown.

Prescribed Antimicrobials

Figure 3.1.16 displays the breakdown of prescribed antimicrobials, by care type. Co-amoxiclav was the most commonly prescribed antimicrobial. Nitrofurantoin, trimethoprim, flucloxacillin, ciprofloxacin, amoxicillin, clarithromycin and cefalexin were also frequently prescribed. See the separate reports of each care type for a more detailed description of antimicrobials.

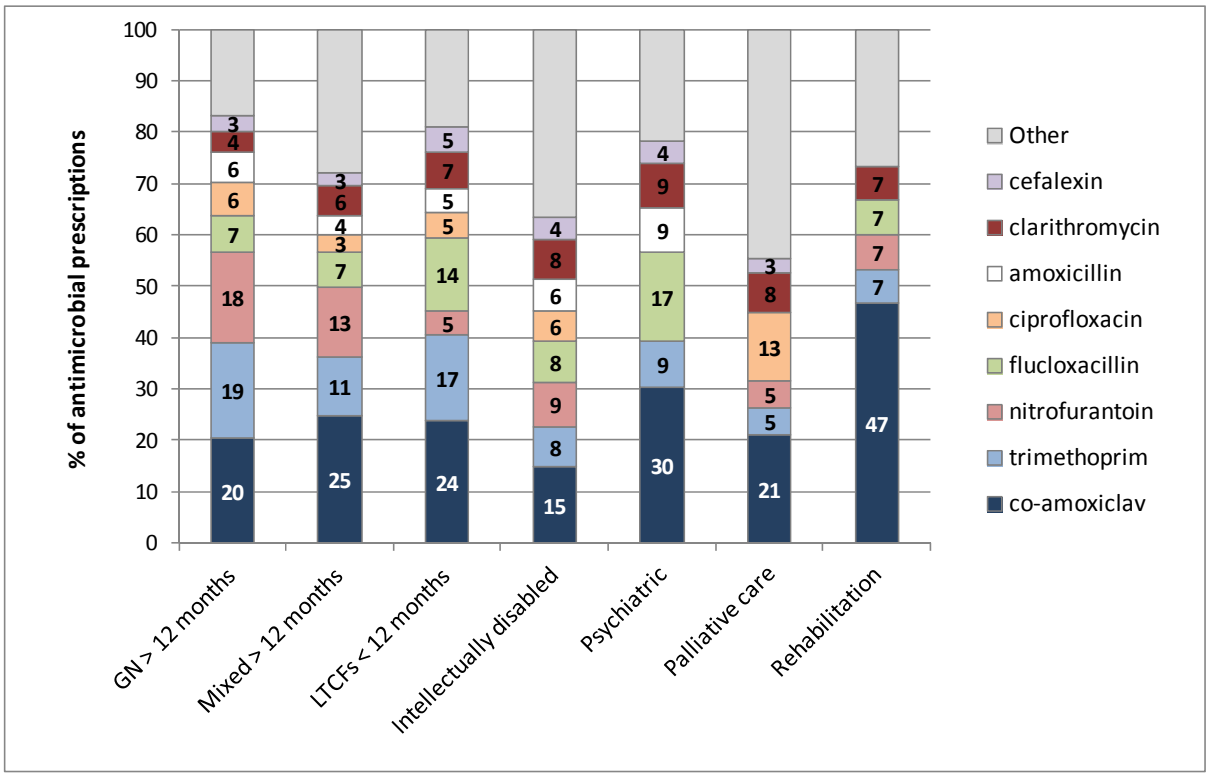

Figure 3.1.16 Prescribed antimicrobials, by care type.

1.2 General Nursing Homes with a LOS greater than 12 months (GN >12m)

1.2.1 Description of Care Type

There were 103 LTCF in this category, with an estimated LOS for the majority of residents greater than 12 months (GN>12m). The majority were HSE-owned (64; 62%), followed by private (32; 31%) and voluntary ownership (7; 7%). GN>12m were distributed around Ireland: Leinster (47), Munster (38), Connacht (9) and Ulster (9), with each accommodating a median of 51 residents (range: 21 – 203).

1.2.2 Description of Residents in GN >12m

Of the 5,807 residents, females predominated (65%) and 47% were ≥85 years. Figure 3.2.1 displays resident demographics, care load indicators and risk factors for HCAI.

Care Load

Sixty-two percent of residents were incontinent of faeces and/or urine. Residents with an indwelling urinary catheter were not counted as incontinent, as per the HALT protocol. Over half were disoriented in time and/or space (57%) and 48% were suffering from impaired mobility (wheelchair-bound or bed-ridden).

HCAI Risk Factors

Of 5,807 GN>12m residents; 5% had a urinary catheter *in situ*. Vascular catheters were uncommon, with only 0.4% having this device. Pressure sores were present in 4% and 10% were reported to have an 'other wound' (e.g., leg ulcer, insertion site of a suprapubic catheter or gastrostomy tube, colostomy, ileostomy, tracheostomy, traumatic or surgical wound). Just 1% had a history of surgery in the past 30 days.

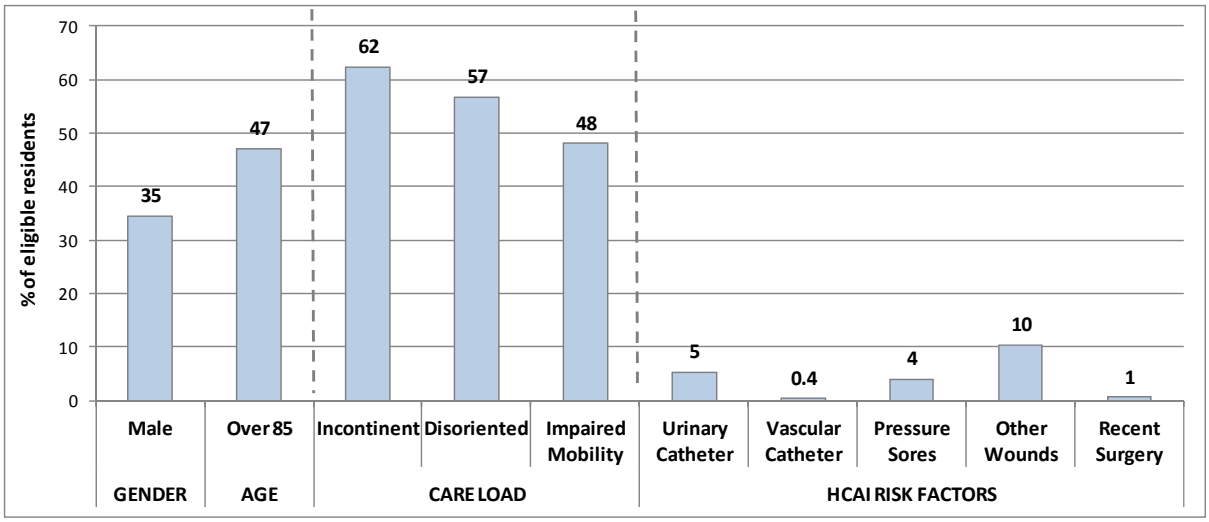

Figure 3.2.1 Resident demographics, care load indicators and HCAI risk factors in GN>12m.

1.2.3 HCAI in GN >12m

Of the 5,807 residents, 337 (5.8%) were reported to have signs or symptoms of infection. Of those, 294 ultimately met a HCAI definition. Therefore, the crude HCAI prevalence was 5.1% (median = 4.2%). Four residents had more than one HCAI. In total, there were 298 HCAI. (Table 3.2.1). There was wide variation in the HCAI prevalence by individual LTCF (0 - 25%), with 15 GN>12m (15%) reporting no residents with HCAI. There was very little difference in median HCAI prevalence by ownership; HSE (4.3%, range: 0-16.7%) and private (3.9%, range: 0–25%), whilst voluntary GN>12m reported a lower median HCAI prevalence (3.2%, range: 0–8.9%).

Table 3.2.1 HCAI prevalence in GN>12m.

HCAI prevalence data	
Number of LTCFs that participated in survey	103
Number of residents surveyed	5807
Number of residents with signs/symptoms of an infection	337
Number of residents with infections[a]	294
Number of infections	298
Residents with more than one infection	4
Crude prevalence of residents with a HCAI infection[b]	**5.1%**
National median prevalence	4.2%
National range (min - max)	0 - 25%
National interquartile range[c]	2 - 7%

[a] As defined by Stone *et al* 2012. [1]

[b] The crude prevalence of residents with a HCAI is the total number of residents with an infection divided by the total number of eligible residents.

[c] The interquartile range is the difference between the first quartile (25th percentile) and the third quartile (75th percentile) of an ordered range of data. It represents the middle fifty percent of the data.

Residents with HCAI: Demographics and HCAI Risk Factors

Of 294 residents with HCAI, the mean age was 81 years (range = 54 – 98) and the majority (68%) had been living in the LTCF for one year or longer. Recent hospital admission (within past three months) was reported for 21% of GN>12m residents with HCAI.

Table 3.2.2 displays a comparison of GN>12m residents with HCAI and the overall GN>12m population with regard to demographics, care load indicators and HCAI risk factors.

Residents with HCAI were significantly more likely to be disoriented (67% vs 57%) and immobile (54% vs 48%) when compared with the overall GN>12m population. The following HCAI risk factors were also significantly more prevalent in residents with HCAI; indwelling urinary catheters (9% vs 5%), 'other wound' types (24% vs 10%) and indwelling vascular catheters (3% vs 0%). However, a resident may have required a vascular catheter for administration of intravenous antimicrobials for HCAI treatment.

Table 3.2.2 Comparison of GN>12m resident demographics, care load indicators and risk factors for residents with HCAI compared to the total GN>12m population.

Resident Characteristic	Total resident population (%)	Residents with an infection (%)	p value	Odd's ratio
Gender/Age				
% male	35	36	0.6791	
% > 85	47	44	0.2613	
Care Load				
Incontinent	62	66	0.1563	
Disoriented	**57**	**67**	**0.0002**	**1.6**
Immobile	**48**	**54**	**0.035**	**1.3**
HCAI Risk Factors				
Urinary Catheter	**5**	**9**	**0.0079**	**1.8**
Vascular Catheter	**0**	**3**	**0.0000**	**10.3**
Pressure Sores	4	6	0.1257	
Other Wounds	**10**	**24**	**0.0000**	**3.0**
Recent Surgery	1	1	0.1233	

*An odd's ratio was only provided where the p-value reached significance (< 0.05).

HCAI Types

Three HCAI categories accounted for 92% of reported infections: UTI (101; 34%), RTI (95; 32%) and skin infections (72; 24%). Figure 3.2.2 displays the distribution of the 298 HCAI, by infection category and Table 3.2.3 provides further breakdown of the HCAI types within each category.

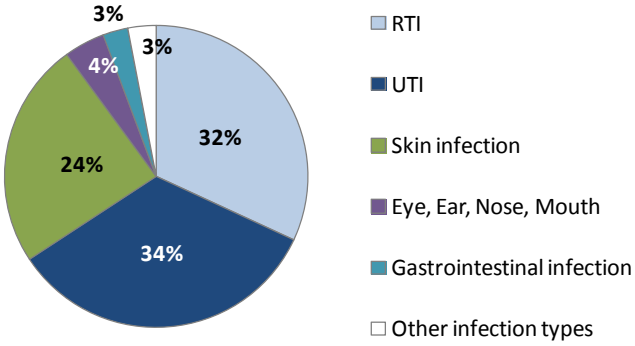

Figure 3.2.2 Distribution of HCAI in GN>12m, by infection category.

Table 3.2.3 HCAI breakdown in GN>12m, by HCAI type and prevalence (**Appendix C***).*

Infection Type		Number of residents with infections		% of residents with infection	
Urinary Tract Infection		101		1.7%	
	Confirmed		*35*		*0.6%*
	Probable		*66*		*1.1%*
Respiratory Tract Infection		95		1.6%	
	Cold		*22*		*0.4%*
	Pneumonia		*4*		*0.1%*
	Flu		*2*		*0.0%*
	Lower respiratory tract infection		*67*		*1.2%*
Skin		72		1.2%	
	Cellulitis		*68*		*1.2%*
	Herpes		*2*		*0.0%*
	Fungal		*2*		*0.0%*
Eye, Ear, Nose, Mouth		13		0.2%	
	Eye		*10*		*0.2%*
	Ear		*1*		*0.0%*
	Mouth		*1*		*0.0%*
	Sinusitis		*1*		*0.0%*
Gastrointestinal		8		0.1%	
	Gastro		*8*		*0.1%*
	C. difficile		*0*		*0.0%*
Other		9		0.2%	
	Bloodstream infection		*0*		*0.0%*
	Fever		*2*		*0.0%*
	Other		*7*		*0.1%*
Total number of residents with infections		**294**		**5.1%**	

UTI

UTI were the most prevalent HCAI, affecting 1.7% of residents. Of the 101 UTI, most (65%) were further categorised as 'probable UTI', based on absence of a positive urine microbiology culture result.

RTI

RTI were the second most prevalent HCAI, affecting 1.6% of residents. Of the 95 RTI, most (71%) were further categorised as 'lower respiratory tract infections'. 'Common cold or pharyngitis' was the second most prevalent RTI type (23%), followed by 'pneumonia' confirmed by chest x-ray (4%) and 'flu' (2%). It is notable that influenza activity in Ireland during May 2013 was at a low level.[2]

Skin Infections

Skin infections were the third most prevalent HCAI, affecting 1.2% of residents. Of the 72 infections, the vast majority (94%) were categorised as 'cellulitis/soft tissue/wound infections'. There were also two cases of herpes infection (i.e., herpes simplex/cold sore or herpes zoster/shingles) and two cases of fungal skin infection. There were no cases of scabies reported in the HALT survey.

Eye, Ear, Nose & Mouth Infections

This infection category was the fourth most prevalent, affecting 0.2% of eligible residents. Of the 13 infections, conjunctivitis accounted for the majority (77%), followed by one case each of ear infection, oral candidiasis and sinusitis (7.5% each).

Gastrointestinal Infections

There were eight cases in the category gastrointestinal infection, affecting 0.1% of residents. All were categorised as 'gastroenteritis', with no *C. difficile* infections reported.

Other Infection Types

There were nine additional infection types reported: Unexplained fever (2)and 'other' infections not categorised in the HCAI subtypes (7). There were no cases of bloodstream infection reported from GN>12m residents.

1.2.4 Antimicrobial Use in GN > 12m

Of the 5,807 GN>12m residents, 541 were prescribed systemic antimicrobials. Therefore, the crude prevalence of antimicrobial use was 9.3% (median = 9.1%). Thirty-two residents were prescribed more than one antimicrobial. In total, information on 572 antimicrobials was recorded (Table 3.2.4). The majority were administered via the oral route (96%), with only 1% intravenous. For the remainder, another administration route (2%) or unknown administration route (1%) was recorded. There was wide variation in the antimicrobial use prevalence by individual LTCF (0 – 28.6%), with five GN>12m (5%) reporting no residents on antimicrobials. There was very little difference in the median antimicrobial use prevalence by ownership; HSE (9%, range: 0-28.6%) and private (9.6%, range: 2.5–26.2%), whilst voluntary GN>12m reported a lower median antimicrobial use prevalence (7.1%, range: 0–17.7%).

Table 3.2.4 Antimicrobial use prevalence in GN>12m.

Antimicrobial prevalence data	
Number of residents surveyed	5807
Number of residents on antimicrobials	541
Number of antimicrobials prescribed	572
Number of residents on more than one antimicrobial	32
Crude prevalence of residents on antimicrobials[a]	**9.3%**
National mean prevalence	9.9%
National median prevalence	9.1%
National range (min - max)	0 - 28.6%
National interquartile range	5.7 - 13.3%

[a] The crude prevalence of residents on antimicrobials is the total number of residents on one or more antimicrobials divided by the total number of eligible residents.

Residents Prescribed Antimicrobials: Demographics, Care Load Indicators and HCAI Risk Factors

Of 541 residents prescribed antimicrobials, the mean age was 80 years (range = 34 – 103) and 43% were ≥85 years. Table 3.2.5 displays a comparison of GN>12m residents on antimicrobials and the overall GN>12m population, with regard to demographics, care load indicators and risk factors.

GN>12m residents on antimicrobials were significantly more likely to be incontinent (70% vs 62%), disoriented (64% vs 57%) and immobile (58% vs 48%). These residents were also significantly more

likely to have an indwelling urinary catheter (12% vs 5%), 'other wound' types (21% vs 10%) or indwelling vascular catheter (1.5% vs 0.4%). However, a resident may have required a vascular catheter for administration of intravenous antimicrobials.

Table 3.2.5 Comparison of GN>12m resident demographics, care load indicators and risk factors for residents on antimicrobials compared to the total GN>12m population.

	Total resident population (%)	Residents on an antimicrobial (%)	p value	Odd's ratio
Gender/Age				
male	35	33	0.384	
> 85	47	43	0.051	
Care Load				
Incontinent	**62**	**70**	**0.000**	**1.5**
Disoriented	**57**	**64**	**0.001**	**1.4**
Immobile	**48**	**58**	**0.000**	**1.6**
HCAI Risk Factors				
Urinary Catheter	**5**	**12**	**0.000**	**2.7**
Vascular Catheter	**0.4**	**1.5**	**0.000**	**5.3**
Pressure Sores	4	5	0.109	
Other Wounds	**10**	**21**	**0.000**	**2.5**
Recent Surgery	1	1	0.168	

Antimicrobial Prescribers & Prescribing Location

For each antimicrobial, information was sought regarding the prescribing location and the prescriber (Table 3.2.6). The majority of antimicrobials in GN >12m (84%) were prescribed in the LTCF, followed by the hospital (11%).

GPs prescribed the majority of antimicrobials (51%), followed by directly-employed doctors (36%) and hospital-based specialists (11%).

Table 3.2.6 Antimicrobial prescriptions in GN>12m, by prescribing location and prescriber.

Where are antimicrobials prescribed?	%
In this facility	84
In the hospital	11
Elsewhere	4
Unknown	1

Who prescribes the antimicrobials?	%
GP	51
Medical doctor employed by the facility	36
Specialist	11
Other	1
Unknown	1

Reasons & Sites for which Antimicrobials were Prescribed

The reason for each of the 572 antimicrobials prescribed to GN>12m residents was recorded. The majority were for treatment of infection (350; 61%), with the remainder for prevention of infection (hereafter known as prophylaxis) (222; 39%). Figure 3.2.3 displays the breakdown by the body site for which the 572 antimicrobials were prescribed. Combined, three body sites accounted for 93% of prescriptions.

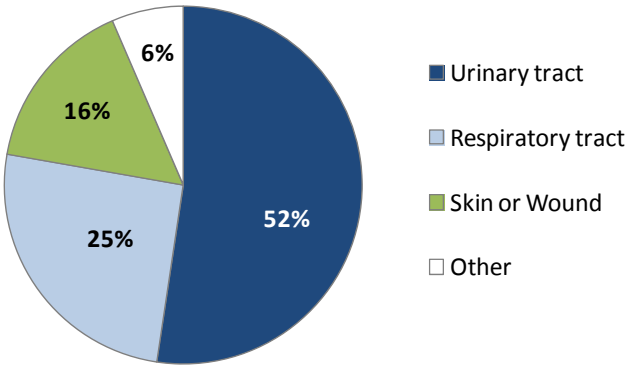

Figure 3.2.3 Prescribed antimicrobials, by body site indication.

The vast majority of prophylaxis was for UTI prevention (86%). Treatment of RTI (37%) and UTI (31%) were the most frequent indications for therapeutic antimicrobials (Figure 3.2.4).

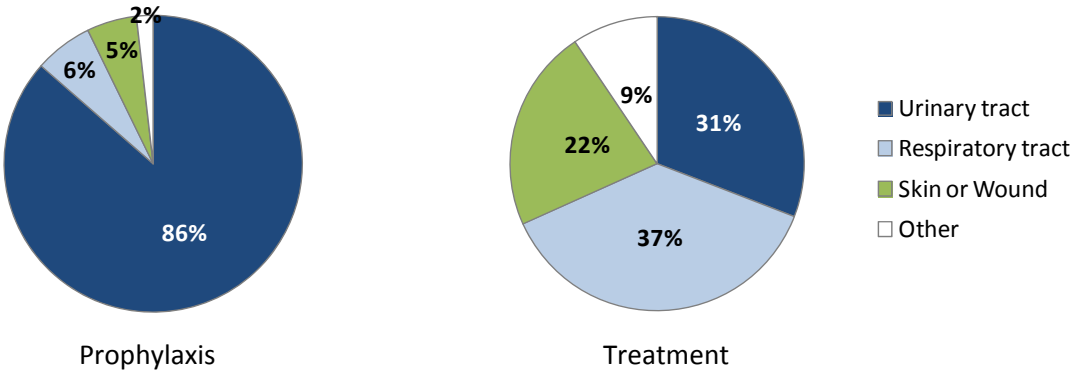

Figure 3.2.4 Breakdown of prophylaxis and treatment, by body site.

Urinary Tract

The urinary tract (UTI treatment or prophylaxis) accounted for the highest proportion of antimicrobials prescribed to GN>12m residents (229; 52%), with the majority of those prescribed for UTI prophylaxis (191; 64%). The prevalence of antimicrobial use for the urinary tract in GN>12m residents was 5.1% (prophylaxis 3.2% and treatment 1.8%). The majority who were prescribed UTI prophylaxis were resident in the LTCF for more than one year (83%) and were significantly more likely to be female (78% vs 65%), incontinent (79% vs 62%), disoriented (68% vs 57%), immobile (64% vs 48%) and to have an indwelling urinary catheter (16% vs 5%) as displayed in Table 3.2.7.

UTI prophylaxis was predominantly prescribed by GPs (55%) or directly-employed doctors (32%), with hospital-based specialists accounting for 11% of UTI prophylaxis prescriptions.

Table 3.2.7 Comparison of resident demographics, care load indicators and risk factors for residents on prophylactic antimicrobials for the urinary tract compared to the total eligible population.

	Total resident population (%)	Residents on a prophylactic antimicrobial for a UTI (%)	p value	Odd's ratio
Gender/Age				
male	**35**	**22**	**0.000**	**0.5**
> 85	47	51	0.299	
Care Load				
Incontinent	**62**	**79**	**0.000**	**2.3**
Disoriented	**57**	**68**	**0.002**	**1.6**
Immobile	**48**	**64**	**0.000**	**1.9**
HCAI Risk Factors				
Urinary Catheter	**5**	**16**	**0.000**	**3.5**
Vascular Catheter	0	0	0.383	
Pressure Sores	4	4	0.844	
Other Wounds	10	10	0.755	
Recent Surgery	1	0	0.262	

For the 107 residents prescribed antimicrobial therapy for suspected UTI, prior to commencing treatment a urine dipstick was performed for 88 (82%) and for 55 (51%), a urine specimen was sent to the microbiology laboratory for culture and susceptibility testing.

Respiratory Tract

The respiratory tract (RTI treatment or prophylaxis) accounted for 25% (n=145) of antimicrobials prescribed to GN>12m residents. The prevalence of antimicrobial use for the respiratory tract was 2.4% (prophylaxis 0.2% and treatment 2.2%).

Skin or Wound

The skin or wound (treatment or prophylaxis for skin/wound infection) accounted for 16% (n=90) of antimicrobials prescribed to GN>12m residents. The prevalence of antimicrobial use for skin/wound was 1.4% (prophylaxis 0.2% and treatment 1.2%).

Prescribed Antimicrobials

Table 3.2.8 displays the most frequently prescribed antimicrobials in GN>12m:

i. Co-amoxiclav was the most common antimicrobial (20.3%). It was mostly prescribed to treat RTI (49%), UTI (25%) and skin/wound infections (9%)
ii. Trimethoprim was the second most common antimicrobial (18.7%). It was only prescribed for urinary tract indications, in particular for UTI prophylaxis (86% of prescriptions)
iii. Nitrofurantoin was the third most common antimicrobial (17.5%). It was only prescribed for urinary tract indications, in particular for UTI prophylaxis (71% of prescriptions)

See **Appendix E** for a more detailed description of prescribed antimicrobials, by the top body sites and indications in GN>12m.

Table 3.2.8 Most frequently prescribed antimicrobials in GN > 12m.

Antimicrobial name	Number of prescriptions (%)
co-amoxiclav	116 (20.3)
trimethoprim	107 (18.7)
nitrofurantoin	100 (17.5)
flucloxacillin	41 (7.2)
ciprofloxacin	36 (6.3)
amoxicillin	34 (6)
clarithromycin	24 (4.2)
cefalexin	17 (3)
phenoxymethylpenicillin	11 (1.9)
other	85 (14.9)
Total	**571 (100)**

2. Appendices

2.1 **Appendix A:** List of Acronyms used in this Report

ABHR	Alcohol-Based Hand Rub
ASC	Antimicrobial Stewardship Committee
CDC	US Centers for Disease Control & Prevention
CDI	*Clostridium difficile* infection
CRE	Carbapenem resistant *Enterobacteriaceae*
ECDC	European Centre for Disease Prevention and Control
ESBL	Extended Spectrum Beta Lactamase
FAQ	Frequently-Asked Questions
GN>12m	General nursing homes with LOS > 12 months
GP	General Practitioner
HAI	Hospital-acquired Infection
HALT	Healthcare-Associated Infections in Long-Term Care Facilities
HCAI	Healthcare-Associated Infection
HIQA	Health Information & Quality Authority
HPSC	Health Protection Surveillance Centre
HSE	Health Service Executive
IPC	Infection Prevention & Control
IPCC	Infection Prevention & Control Committee

IPCN	Infection Prevention & Control Nurse
LOS	Length-of-Stay
LTCF	Long-Term Care Facility
LTCF<12m	LTCF (either general nursing home or mixed care type) with LOS < 12 months
MHC	Mental Health Commission
Mixed>12m	Mixed care facilities with LOS > 12 months
MRSA	Meticillin Resistant *Staphylococcus aureus*
MSSA	Meticillin Susceptible *Staphylococcus aureus*
MDRO	Multi-Drug Resistant Organisms
PPE	Personal Protective Equipment
PPS	Point Prevalence Survey
RCPI	Royal College of Physicians of Ireland
RTI	Respiratory Tract Infection
SHEA	Society for Healthcare Epidemiology of America
UTI	Urinary Tract Infection
VRE	Vancomycin Resistant Enterococci
WIV-ISP	Scientific Institute for Public Health, Brussels, Belgium
WTE	Whole Time Equivalent

2.2 Appendix B: Prescribed Antimicrobials in GN>12m, by top three body sites and indications.

Table 7.4.1 Antimicrobials prescribed for the urinary tract in GN>12m.

Antimicrobial name	Number of prescriptions (%)	Antimicrobial name	Number of prescriptions (%)
Treatment for UTI		**Prophylaxis against UTI**	
amoxicillin and enzyme inhibitor	29 (26.9)	trimethoprim	92 (48.2)
nitrofurantoin	29 (26.9)	nitrofurantoin	71 (37.2)
ciprofloxacin	20 (18.5)	cefalexin	9 (4.7)
trimethoprim	14 (13)	amoxicillin and enzyme inhibitor	6 (3.1)
cefalexin	6 (5.6)	ciprofloxacin	6 (3.1)
amoxicillin	4 (3.7)	amoxicillin	2 (1)
cefaclor	2 (1.9)	other	5 (2.6)
cefuroxime	2 (1.9)		
other	2 (1.9)		
Total	**108 (100)**	**Total**	**191 (100)**

Table 7.4.2 Antimicrobials prescribed for the respiratory tract in GN>12m.

Antimicrobial name	Number of prescriptions (%)	Antimicrobial name	Number of prescriptions (%)
Treatment for RTI		**Prophylaxis against RTI**	
Amoxicillin and enzyme inhibitor	57 (43.5)	Amoxicillin and enzyme inhibitor	4 (28.6)
Amoxicillin	23 (17.6)	Azithromycin	3 (21.4)
Clarithromycin	18 (13.7)	Clarithromycin	2 (14.3)
Ciprofloxacin	5 (3.8)	Other	5 (35.7)
Doxycycline	3 (2.3)		
Cefaclor	2 (1.5)		
Cefuroxime	2 (1.5)		
Piperacillin and enzyme inhibitor	2 (1.5)		
Cefixime	2 (1.5)		
Erythromycin	2 (1.5)		
Levofloxacin	2 (1.5)		
Other	13 (9.9)		
Total	**131 (100)**	**Total**	**14 (100)**

Table 7.4.3 Antimicrobials prescribed for skin/wound indication in GN>12m.

Antimicrobial name	Number of prescriptions (%)	Antimicrobial name	Number of prescriptions (%)
Treatment of skin infection		**Prophylaxis against skin infection**	
flucloxacillin	41 (52.6)	doxycycline	3 (25)
amoxicillin and enzyme inhibitor	10 (12.8)	ciprofloxacin	2 (16.7)
phenoxymethylpenicillin	8 (10.3)	tetralysal	2 (16.7)
amoxicillin	3 (3.8)	other	5 (41.7)
ciprofloxacin	2 (2.6)		
clarithromycin	2 (2.6)		
metronidazole	2 (2.6)		
minocycline	2 (2.6)		
other	8 (10.3)		
Total	**78 (100)**	**Total**	**12 (100)**

PLEASE NOTE:

This report represents a shortened version of the full national HALT report focusing on data from General Nursing homes.

The full national report including methodology, results on all LTCF care types, discussion and future priorities can be found on the hpsc website here.