Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

hpsc

Report on Hand Hygiene Compliance in HSE Acute Hospitals
Period 1, June 2011

Executive summary

- **Improving hand hygiene compliance by healthcare workers is a priority for the Health Service Executive (HSE). Measuring hand hygiene compliance using a standardised procedure and trained and validated auditors is critical to ensure that results are comparable over time. A standard operating procedure for measuring hand hygiene compliance was developed by the HSE Hand Hygiene Steering Group (Appendix 1)**

- **Acute hospitals were required to undertake a hand hygiene compliance audit in June 2011 in seven randomly selected wards and observe 30 opportunities per ward**

- **The overall compliance was 74.7%, which is just under the target of 75% set by the HSE for 2011. Tables 2-5 summarises compliance by hospital. Caution should be used when interpreting these results as small differences between facilities may not be statistically significant**

- **The compliance for the different categories of healthcare worker was: nurses 81.0%, doctors 60.7%, auxiliary staff [i] 68.8% and other healthcare staff [ii] 74.9%**

- **This result presents the first published baseline data on hand hygiene compliance from 36 acute hospitals in Ireland. Biannual reports will be published on an ongoing basis. An additional nine hospitals are expected to submit data for Period 2 (October 2011)**

- **The HSE has set a target of achieving > 90% compliance with hand hygiene by 2013. To achieve this, healthcare facilities should develop actions plans including education and training and re-audit to improve compliance**

[i] Auxiliary includes healthcare assistants, porters, catering and household services
[ii] Other includes physiotherapists, radiologists, dieticians, social workers and pharmacists

1. Introduction

Hand hygiene is one of the most effective means of reducing healthcare associated infection (HCAI). However, compliance by healthcare workers with recommended hand hygiene frequencies and techniques has been reported as suboptimal.[1;2] Time constraints, skin integrity, inadequate physical resources (e.g. inadequate number of sinks) and absence of role models have been identified as barriers to compliance with hand hygiene.[3] Improved compliance has been reported following education, [1] introduction of alcohol gels/rubs,[4] audit and feedback,[5] and local promotion activities.

Measuring hand hygiene compliance by direct observation is described by the World Health Organisation (WHO) as the gold standard.[6] In 2009, a hand hygiene observational standard operating procedure (SOP) was developed by the Health Protection Surveillance Centre (HPSC) and Infection Protection Society and used in acute hospitals. Following an evaluation, a multidisciplinary steering group was established and a revised SOP was published in 2011 which can be accessed at http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/Handwashing/AuditTools/

2. Method

The WHO methodology for undertaking hand hygiene observational audits was adopted with the exception of sample size calculation. Healthcare workers were observed for their compliance against the WHO '5 moments of hand hygiene' (Appendix 2). National workshops for training lead auditors were held in March 2011. Each auditor's inter-rater reliability was assessed using the Kappa statistic.

For the national audit in June 2011 (Period 1), acute hospitals were required to measure healthcare worker compliance against 30 hand hygiene opportunities for each of the seven randomly selected wards in their facility resulting in 210 opportunities per hospital.

Results were entered into a Microsoft Excel tool and forwarded to the HPSC for analysis. Audits undertaken in July 2011 were accepted for analysis. For facilities that submitted more than the required 210 opportunities, the first 30 opportunities per ward were used for the analysis. Facilities that submitted less than 180 opportunities were not included in the analysis. Binomial exact 95% confidence intervals are presented.

While standardised hand hygiene auditor training and validation (with inter-rater reliability testing) should ensure that measurement of hand hygiene should be comparable, the results presented in this report have not been validated by external auditors. Therefore it is possible that hand hygiene auditing may not have been performed in a comparable fashion in all hospitals.

Results

2.1 Overall Hand Hygiene Compliance in Acute Hospitals

Results from 36 hospitals were analysed for this report. In total, 7,515 opportunities for hand hygiene were observed; achieving an average compliance of 74.7% (Table 1) which is broadly in line with the HSE target of 75% for 2011. The compliance in different facilities ranged between 54.8% and 91.9% (Tables 2, 3, 4 and 5).

Table 1: Overall hand hygiene compliance and by HSE region for Period 1 (June 2011) for 36 acute hospitals.

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
HSE - South	1,665	1,260	75.7%	73.5%	77.7%
HSE - Dublin North-East	1,679	1,273	75.8%	73.7%	77.9%
HSE - Dublin Mid-Leinster	2,100	1,662	79.1%	77.3%	80.9%
HSE - West	2,071	1,415	68.3%	66.3%	70.3%
Overall	7,515	5,610	74.7%	73.7%	75.6%

Table 2: Hand hygiene compliance by individual acute hospitals in HSE – South for Period 1 (June 2011).

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Bantry General Hospital	210	145	69.0%	62.3%	75.2%
Cork University Hospital [1]					
Kerry General Hospital, Tralee	210	173	82.4%	76.5%	87.3%
Mallow General Hospital	210	162	77.1%	70.9%	82.6%
Mercy University Hospital, Cork	210	160	76.2%	69.8%	81.8%
South Infirmary - Victoria University Hospital, Cork [2]					
South Tipperary General Hospital, Clonmel	210	151	71.9%	65.3%	77.9%
St Luke's General Hospital, Kilkenny [3]	210	173	82.4%	76.5%	87.3%
St Mary's Orthopaedic Hospital, Gurranebraher, Cork [4]					
Waterford Regional Hospital	209	180	86.1%	80.7%	90.5%
Wexford General Hospital	196	116	59.2%	52.0%	66.1%

1 - Aiming to undertake hand hygiene compliance audits in the coming months: 2 - Undertaking audits using a different protocol and planning to join national reporting in Period 2 (October 2011) : 3 - Incorporating Lourdes Orthopaedic Hospital, Kilcreene: 4 - Insufficient data for publication and transferring to another facility for Period 2 (October 2011) .

Table 3: Hand hygiene compliance by individual acute hospitals in HSE – Dublin North-East for Period 1 (June 2011).

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Beaumont Hospital [1]					
Cappagh National Orthopaedic Hospital, Dublin	209	158	75.6%	69.2%	81.3%
Cavan General Hospital	210	146	69.5%	62.8%	75.7%
Children's University Hospital, Temple Street [1]					
Connolly Hospital, Blanchardstown	210	180	85.7%	80.2%	90.1%
Louth County Hospital, Dundalk	210	193	91.9%	87.4%	95.2%
Mater Misericordiae University Hospital	210	117	55.7%	48.7%	62.5%
Our Lady of Lourdes Hospital, Drogheda	210	150	71.4%	64.8%	77.4%
Our Lady's Hospital, Navan	210	164	78.1%	71.9%	83.5%
Rotunda Hospital	210	165	78.6%	72.4%	83.9%

1 - Undertaking audits using a different protocol and planning to join national reporting in Period 2 (October 2011).

Table 4: Hand hygiene compliance by individual acute hospitals in HSE – Dublin Mid-Leinster for Period 1 (June 2011).

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Adelaide & Meath & National Children's Hospital, Tallaght [1]					
Coombe Women's Hospital	210	175	83.3%	77.6%	88.1%
Midland Regional Hospital Mullingar	210	156	74.3%	67.8%	80.1%
Midland Regional Hospital Portlaoise	210	153	72.9%	66.3%	78.7%
Midland Regional Hospital Tullamore	210	159	75.7%	69.3%	81.4%
Naas General Hospital [2]					
National Maternity Hospital, Holles Street [1]					
Our Lady's Hospital for Sick Children, Crumlin [1]					
Royal Victoria Eye & Ear Hospital, Dublin	210	160	76.2%	69.8%	81.8%
St Columcille's Hospital, Loughlinstown	210	157	74.8%	68.3%	80.5%
St James's Hospital	210	180	85.7%	80.2%	90.1%
St Luke's Hospital, Dublin	210	167	79.5%	73.4%	84.8%
St Michael's Hospital, Dun Laoghaire	210	175	83.3%	77.6%	88.1%
St Vincent's University Hospital	210	180	85.7%	80.2%	90.1%

1 - Undertaking audits using a different protocol and planning to join national reporting in Period 2(October 2011): 2- Planning to join the national reporting system in Period 2 (October 2011).

Table 5: Hand hygiene compliance by individual acute hospitals in HSE – West for Period 1 (June 2011).

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Galway University Hospitals [1]	210	115	54.8%	47.8%	61.6%
Letterkenny General Hospital	210	137	65.2%	58.4%	71.7%
Mayo General Hospital, Castlebar	210	130	61.9%	55.0%	68.5%
Mid-Western Regional Hospital Ennis	209	152	72.7%	66.2%	78.6%
Mid-Western Regional Hospital Nenagh	210	166	79.0%	72.9%	84.3%
Mid-Western Regional Hospital, Dooradoyle, Limerick	210	164	78.1%	71.9%	83.5%
Mid-Western Regional Maternity Hospital, Limerick [2]					
Mid-Western Regional Orthopaedic Hospital, Croom [3]					
Portiuncula Hospital, Ballinasloe	210	119	56.7%	49.7%	63.5%
Roscommon County Hospital	184	117	63.6%	56.2%	70.5%
Sligo General Hospital	210	167	79.5%	73.4%	84.8%
St John's Hospital, Limerick	208	148	71.2%	64.5%	77.2%

1 - Incorporating Merlin Park Regional Hospital, Galway: 2 - Undertaking audits using a different protocol and planning to join national reporting in Period 2(October 2011): 3 - Insufficient data for publication

2.2 Hand Hygiene Compliance by Healthcare Worker Category

Compliance for different categories of healthcare workers varied from 60.7% for medical to 81.0% for nursing staff (Table 2, Figure 1). The 'Auxiliary' healthcare worker category (includes healthcare assistants, porters, catering and household services) compliance was 68.8% which was much lower than compliance among the 'Other' healthcare worker category (includes physiotherapists, radiologists, speech and language, dieticians, social workers and pharmacists) at 74.9%.

Table 2: Hand hygiene compliance by healthcare worker category for Period 1 (June 2011) for 36 acute hospitals.

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Nurse	4,336	3,512	81.0%	79.8%	82.2%
Auxiliary[a]	1,138	783	68.8%	66.0%	71.5%
Medical	1,505	914	60.7%	58.2%	63.2%
Other[b]	534	400	74.9%	71.0%	78.5%

[a] Auxiliary includes healthcare assistants, porters, catering and household services
[b] Other includes physiotherapists, radiologists, dieticians, social workers and pharmacists

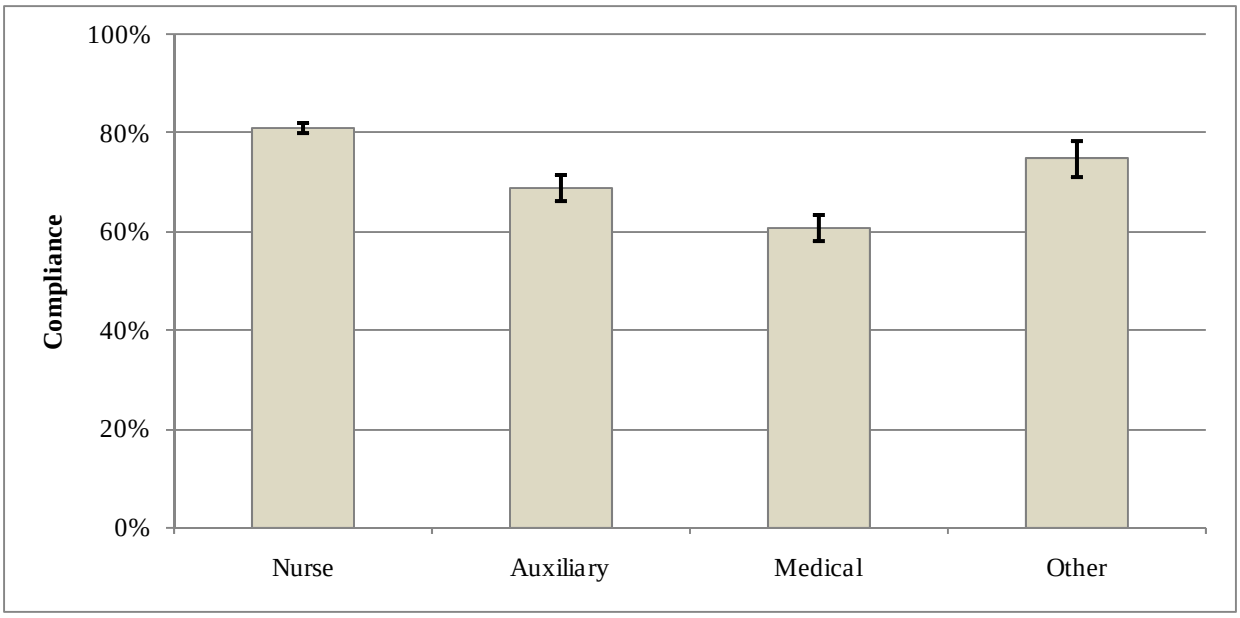

Figure 1: Hand hygiene compliance by healthcare worker category for Period 1 (June 2011) for 36 acute hospitals, including 95% confidence intervals.

Note: ***'Auxiliary' includes healthcare assistants, porters, catering and household services.***
'Other' includes physiotherapists, radiologists, dieticians, social workers and pharmacists.

2.3 Compliance with the Five Moments of Hand Hygiene

Compliance with hand hygiene can be divided into the five WHO moments (see appendix 2). Compliance for moment 5 (after touching patient surroundings) was 67.4%, the lowest compared with compliance for moment 3 (after body fluid exposure risk) at 82.5% (Table 3, Figure 2). Compliance for moment 4 (after touching a patient) was 80.4%.

Table 3: Hand hygiene compliance by the five WHO moments for Period 1 (June 2011) for 36 acute hospitals.

	Hand Hygiene Opportunities	Hand Hygiene Actions	Percent Compliance	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Moment 1	1,928	1,423	73.8%	71.8%	75.8%
Moment 2	491	364	74.1%	70.0%	78.0%
Moment 3	781	644	82.5%	79.6%	85.1%
Moment 4	2,802	2,253	80.4%	78.9%	81.9%
Moment 5	2,036	1,372	67.4%	65.3%	69.4%

Moment 1: Before touching a patient; Moment 2: Before clean/aseptic procedure; Moment 3: After body fluid exposure risk; Moment 4: After touching a patient; Moment 5: After touching patient surroundings

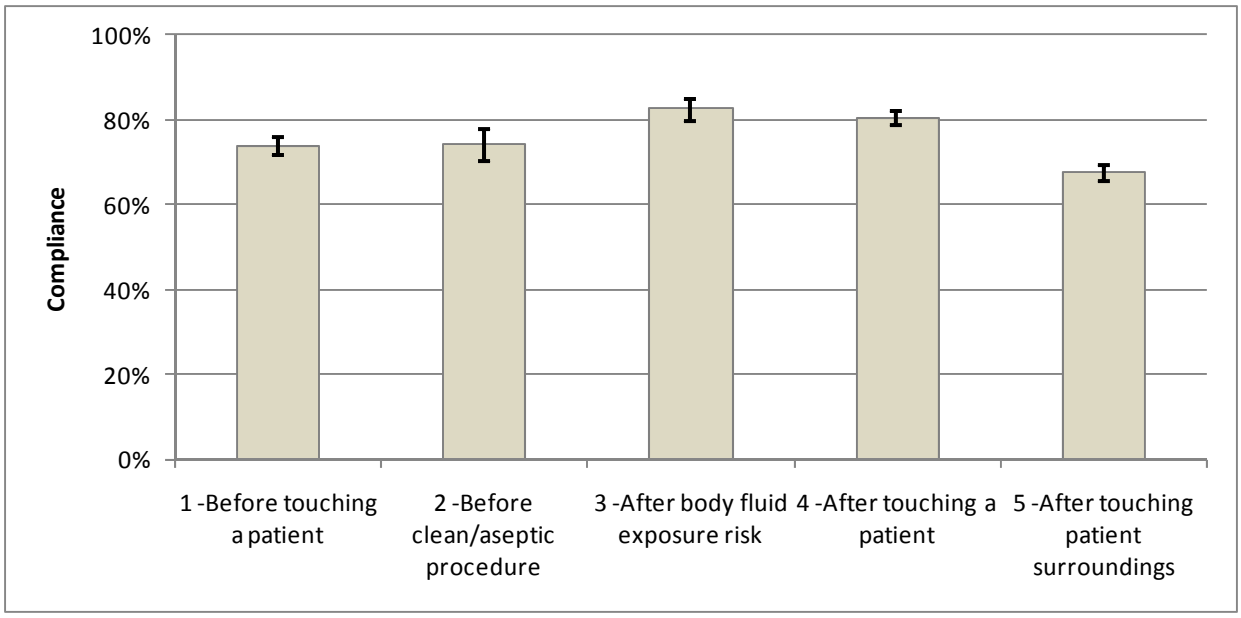

Figure 2: Hand hygiene compliance by the five WHO moments for Period 1 (June 2011) for 36 acute hospitals, including 95% confidence intervals.

3. Limitations of Auditing Hand Hygiene with Direct Observation

The results may not be reflective of healthcare worker compliance at all times. Compliance with hand hygiene is measured by auditors observing healthcare workers undertaking patient care. It is well recognised that workers will change their behaviour, if aware that they are being observed (Hawthorne effect). However, it is also known that this effect wears off over time and that healthcare workers under observation may not be aware (due to the many competing demands on their attention) of the presence of the auditor. In addition, the purpose of auditing is to improve practice, therefore any action that improves compliance increases patient safety. Auditors are requested to give immediate feedback to ward staff following an audit, thereby increasing awareness and knowledge of hand hygiene.

All auditors measured compliance in the facility in which they work; therefore there may be an element of bias in the results. This risk of bias should be balanced by the benefits of increasing local staff's knowledge and awareness of hand hygiene.

The sample size per hospital (210 opportunities) has a margin of error of 7%. A larger sample size would provide proportions with a narrower margin of error especially at ward level. However, hand hygiene auditing is very labour intensive and without dedicated auditors, the time allocated must be balanced against other service needs.

The duration of and the technique for hand hygiene which are important elements of good practice were not measured as a mandatory component of this audit in line with the WHO protocol.

4. Discussion

The result from the first national hand hygiene compliance audit in 36 acute hospitals are presented in this report. The overall compliance was 74.7% which is in line with the HSE target of 75% for 2011. However, the HSE has set a target of achieving greater than 90% compliance by 2013. There are many factors that can contribute to improving healthcare workers hand hygiene compliance including improved infrastructure (e.g. access to alcohol gel at the point of care), increased awareness through education, audit and feedback, support from senor management/clinicians and an informed patient population.[6;7] A multi-model strategy is recommended by the WHO to improve hand hygiene compliance including system change, training and education, evaluation and feedback, training and education and institutional safety.[8]

Nurses and the 'Other' (primarily allied health professionals) staff group achieved the highest compliance (81% and 74.9%) with medical staff (60.7%) and the 'Auxiliary' group (68.8%) reporting lower compliance. The WHO 5 moments of hand hygiene define when healthcare workers should wash their hands when undertaking care at the bedside. Moment 3 (after body fluid exposure risk) and moment 4 (after touching a patient) achieved the highest compliance (82.5% and 80.4% respectively), with moment 5 achieving the lowest at 67.4%. These findings are consistent with the other published data.[9;10] Determining compliance between different staff categories and by the '5 moments of hand hygiene' allows facilities to target educational initiatives where most needed.

Eight of the eleven acute hospitals not reporting data plan to join the national reporting system in October 2012. Seven of these hospitals have undertaken hand hygiene compliance auditing in 2011 using a different methodology. Two hospitals submitted insufficient data for publication and one facility aims to undertake hand hygiene audits in the coming months.

5. Conclusions and Recommendations

The average hand hygiene compliance by healthcare workers is broadly comparable with other countries; however improving compliance must be a priority. Hospitals should ensure that a hand hygiene training and audit programme is in place and that an action plan is developed for each ward/unit in which the hand hygiene compliance is less than the nationally set target (currently 75%). Hand hygiene compliance should be monitored on a regular basis and results fedback widely to all hospital staff and presented at senior management team meetings. All hospitals should ensure that they have a trained lead auditor to perform hand hygiene audits in a standardised fashion to enable comparisons within the hospital to be made over time.

Hospital hand hygiene programmes must be supported by senior hospital managers and clinical leaders to ensure implementation of national and international best practice hand hygiene guidelines. Hand hygiene auditing is resource intensive and provision of those resources must remain a priority.

Improving hand hygiene compliance to greater than 90% by 2013 in acute hospitals will require commitment from all HSE staff and consideration should be given to implementing the WHO multi-model strategy in all facilities.

Acknowledgements

We would like to acknowledge the commitment of the hand hygiene auditors in each hospital without whom this report would not be possible.

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Appendix 1: Membership of the Hand Hygiene Steering Group

- Dr Michael Mulhern: Consultant Microbiologist, Letterkenny General Hospital (Chair)
- Ms. Michelle Bergin: Infection Prevention and Control Nurse, Midland Regional Hospital Tullamore; representing the Infection Prevention Society
- Ms Sheila Donlon: Infection Control Manager Health Protection Surveillance Centre
- Dr Susan FitzGerald: Consultant Microbiologist, St Vincent's University and St. Columcille's Hospitals; representing the Irish Society of Clinical Microbiologists
- Dr Fidelma Fitzpatrick: RCPI /HSE HCAI clinical lead and Consultant Microbiologist, Beaumont Hospital & HPSC
- Ms Maire Flynn: Infection Prevention and Control Nurse, Kerry Community Services; Representing the Infection Prevention Society
- Dr. Arthur Jackson: SpR in Infectious Diseases, Beaumont Hospital, Dublin; representing the Infectious Diseases Society of Ireland
- Dr. Aliya Khan: SpR in Clinical Microbiology, Beaumont Hospital, Dublin
- Mr. Ajay Oza: Surveillance Scientist, Health Protection Surveillance Centre
- Ms Mary Francis Reilly: Director. NMPDU, Merlin Park, Regional Hospital, Galway; Office of the Nursing Director
- Ms Maura Smiddy: Lecturer, Dept Epidemiology and Public Health, University College Cork

Appendix 2: WHO 5 Moments of Hand Hygiene