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Study concludes active surveillance testing with molecular methods reduces transmission of MRSA among surgical patients

Patient screening for carriage of methicillin-resistant *Staphylococcus aureus* (MRSA) using a rapid molecular test significantly reduces MRSA transmission when compared to standard culture based methods, according to research published in *Clinical Microbiology and Infection* by a team of researchers at The Heart of England NHS Foundation Trust. The NHS-sponsored study, "Reduction in the rate of methicillin-resistant *Staphylococcus aureus* acquisition in surgical wards by rapid screening for colonisation: a prospective, cross-over study," appears in the February 2010 issue of the journal.

"This study provided a challenging test of the value of rapid versus slower culture-based methods for MRSA screening because of the limited availability of isolation rooms", said Dr Peter Hawkey, professor of clinical and public health bacteriology, consultant medical microbiologist, West Midlands Health Protection Agency Public Health Laboratory, Heart of England NHS Foundation Trust. "We conclude that the introduction of MRSA screening using rapid tests and the protocol we have described can significantly reduce MRSA transmission."

Led by researchers at the Heart of England NHS Foundation Trust, University of Birmingham, Health Protection Agency Birmingham Regional Laboratory and University of Warwick, the prospective cross-over study of nearly 11,000 patients admitted to seven surgical wards over 16 months, compared the impact of employing a rapid molecular test (BD GeneOhm™ MRSA assay) to conventional chromogenic culture media for detecting MRSA nasal carriage. Results of this study demonstrated a significant 1.5 fold-increased risk of MRSA acquisition when patients were screened with the culture method as compared with molecular testing. The mean time for reporting positive results for the rapid molecular test was 0.9 days versus 3.3 days for the chromogenic culture test. The study authors attribute the reductions in MRSA transmissions to this shortened time to test result.

Active surveillance testing seeks to identify patients who are carriers of MRSA but do not show visible symptoms or signs of MRSA infection [1]. Rapid identification of MRSA colonized patients at admission and during hospitalization allows for immediate implementation of contact precautions and other preventive measures to minimize infection risk to both colonized and non-colonized patients.

The study consisted of two eight-month cross-over periods in which patients were tested upon admission, every four days thereafter until discharged, by one of the two test methods. All wards practised the same infection control procedures, which were constant for the duration of the study. Patients with a positive test result were cared for with comprehensive infection prevention measures, which included isolation whenever possible and decolonization with nasal antibiotic and antibacterial body wash. Due to the limited availability of single rooms for patient isolation, the dominant intervention was early patient identification. The wards involved in this study had a high bed occupancy and low availability of isolation rooms, making it applicable to the majority of healthcare systems worldwide.

In the UK in the early 1990s, two percent of *Staphylococcus aureus* bacteremias were due to MRSA [1]. In 2005, the mean figure had reached 45 percent and UK levels of MRSA bloodstream infections ranked among the highest in Europe [1]. That same year, the Department of Health set a target to reduce MRSA bloodstream infections by 50 percent for all Acute Trusts by March 2008. The Code of Practice for the Prevention and Control of Health Care Associated Infections [2] states that the infection prevention and control policy should make provisions for pre-admission screening in addition to decontamination and

isolation of colonized patients, and antibiotic prophylaxis for surgery. This study demonstrates that the use of rapid surveillance testing can further accelerate the reduction in MRSA transmission.

References

1. Boyce, J.M., Cookson, B., Christiansen, K., Hori, S., Vuopio-Varkila, J., Kocagöz, S., et al (2005). Methicillin-resistant *Staphylococcus aureus*. *The Lancet Infectious Diseases*, **5**(10), 653-663.
2. Department of health (2006). The Health Act 2006: Code of practice for the prevention and control of health care associated infections. Available at:
www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4139337.pdf.

Pandemic (H1N1) 2009 influenza: vaccination programme continues

The Chief Medical Officer for England has written to GPs, practice nurses, hospital doctors and lead nurses in PCTs about the continued importance of the pandemic H1N1 (2009) influenza vaccination programme that has gathered pace since Christmas as more people in the clinical at-risk groups have been vaccinated.

Some 4.54 million doses have been administered to date to people in the priority groups, including 518,000 doses given to healthy children over six months and under five years of age. The CMO notes, however, that uptake levels in the other parts of the United Kingdom and some European countries are higher than achieved in England and calls for awareness to be maintained about the continued delivery of the programme by the NHS.

1. Department of Health Central Alerting System. **Pandemic H1N1 (2009) influenza vaccination programme**, 18 February 2010.

Infection reports

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Bacteraemia/HCAI

Voluntary surveillance of *Clostridium difficile* in England, Wales and Northern Ireland, 2009

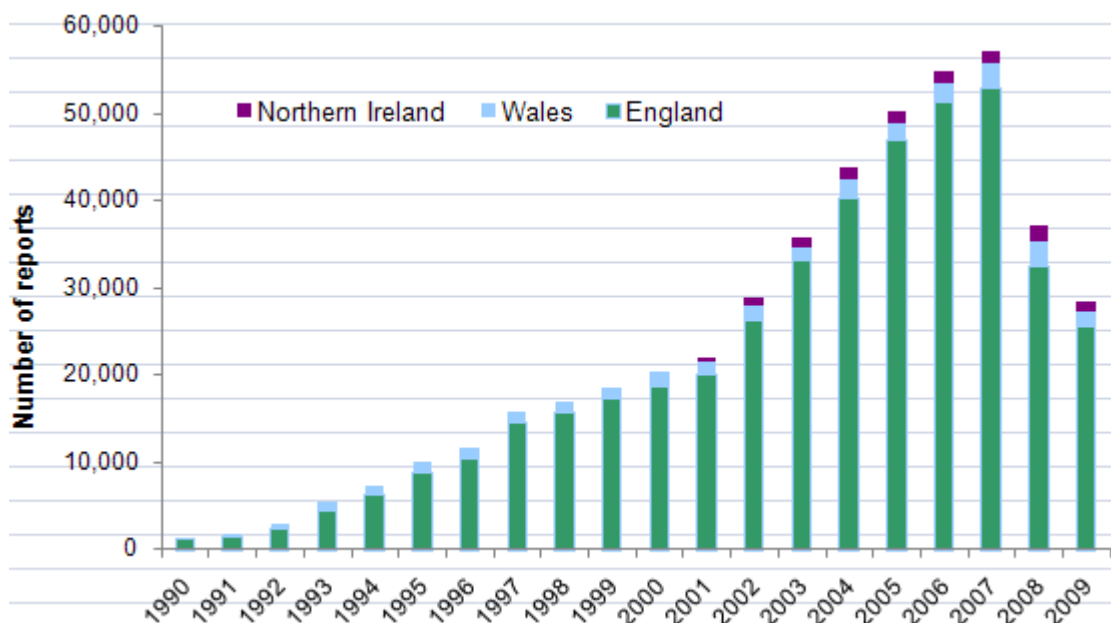
x The dataset used here comprises laboratory based surveillance of *Clostridium difficile* faecal samples in England and Wales that has been reported since 1990 as part of the then Public Health Laboratory Service's voluntary monitoring of infectious diseases. From 2001, this surveillance was extended to include Northern Ireland [1].

This update describes reports of *C. difficile* faecal samples made to the HPA in 2009 from laboratories in England, Wales and Northern Ireland.

Key points

- ▶ There were 28,458 reports in 2009, comprising 25,719 from England, 1,754 from Wales and 985 from N. Ireland. This was a 23% decrease in the number of *C. difficile* laboratory reports compared to 2008 (Figure 1);
- ▶ The incidence rate of *C. difficile* per population have decreased in England, Wales and Northern Ireland from 63 to 50, 96 to 59 and 94 to 55 samples per 100,000 population respectively;
- ▶ Around 77% of all reported cases were in the 65 years and over age group (Figure 2);
- ▶ The number of laboratories across England, Wales and Northern Ireland reporting cases of *C. difficile* has decreased by 1% from 173 in 2008 to 171 in 2009.

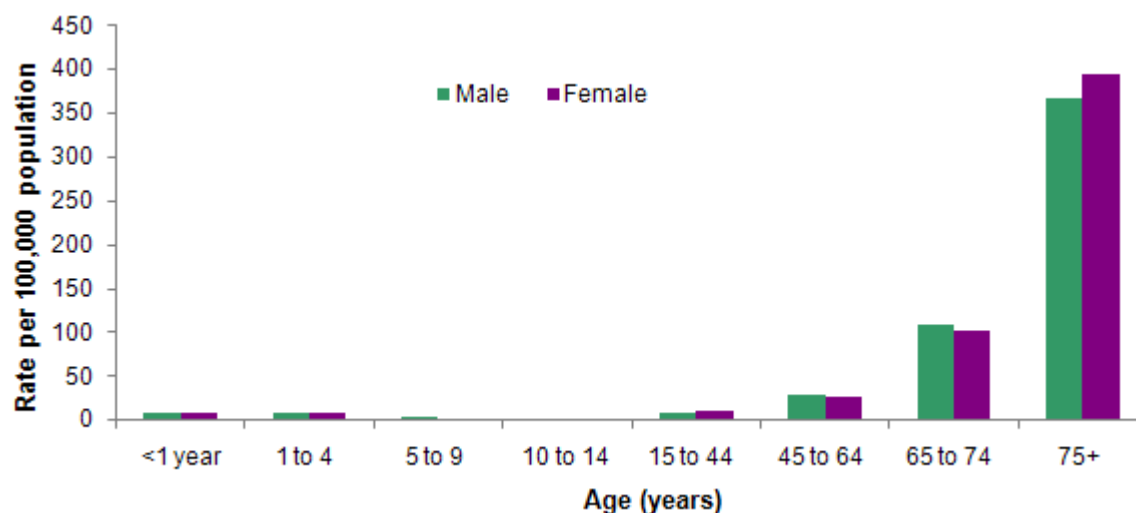
Figure 1. Voluntary laboratory reports of *C. difficile* positive faecal specimens: England, Wales and Northern Ireland ** 1990 - 2009*



* Data from 2009 are provisional (data was extracted on 28 th January 2010).

** Northern Ireland reports included from 2001

Figure 2. Age specific rates† of *C. difficile* from laboratory reports under voluntary reporting scheme: England, Wales and Northern Ireland 2009*



* Data from 2009 are provisional (data was extracted on 28 January 2009).

† Rates are calculated using 2008 ONS mid-year population estimates.

Further information and analysis on *Clostridium difficile* infection voluntary reporting is available on the Agency's website at [HPA - Clostridium difficile](#).

Acknowledgements

We are grateful to microbiology colleagues in NHS acute Trusts for their contributions to this reporting scheme, as well as efforts from colleagues in the regional offices of the Health Protection Agency.

Reference

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Emerging infections/CJD

Creutzfeldt-Jakob disease (CJD) biannual update (2010/1)

This six-monthly report provides an update on reports of incidents of potential iatrogenic (healthcare-acquired) exposure to CJD via surgery, and on the National Anonymous Tonsil Archive. Data are correct as of 26 January 2010.

For numbers of CJD case reports, readers should consult data provided by the national CJD Surveillance Unit (NCJDSU), Edinburgh [1]. The latest yearly analysis of vCJD reports (onsets and deaths) is also available from the NCJDSU website [2].

Reports of incidents of potential iatrogenic exposure to CJD via surgery: 2000 to 31 December 2009

Since the previous update report [3], 19 surgical incidents were reported – between 1 July and 31 December 2009 – bringing the total number reported since 2000 to 407 (table 1). A surgical incident occurs when a patient undergoes surgery but is only identified as having CJD or being at risk of CJD at a later date. This means that the ACDP TSE Working Group infection control guidelines would not have been followed. The surgery carried out on an index patient with, or at risk of CJD, may result in contamination of the instruments with abnormal prion protein. Table 1 shows the number of CJD surgical incidents reported to the CJD Incidents Panel from January 2000 to 31st December 2009 by the diagnosis of the index patient. Information about the CJD Incidents Panel can be found on the HPA website [4].

Table 1. Closed CJD Surgical Incidents (n=407) reported to the CJD Incidents Panel, by diagnosis of index patient: 1 January 2000 to 30 June 2009

Incident type	2000	2001	2002	2003	2004	2005	2006	2007	2008	First half 2009	Total
1. Sporadic (possible, probable or definite)	7	19	22	24	16	18	31	17	21	11	186(46%)
2. vCJD (possible, probable or definite)	6	14	22	5	4	1	2	–	1	1	56(14%)
3. Familial including 'at risk' familial	–	2	2	7	1	3	7	–	2	2	26(6%)
4. 'At risk' vCJD blood component recipient	–	–	–	–	4	10	6	1	–	–	21(5%)
5. 'At risk' - vCJD plasma product recipient	–	1	2	–	10	18	9	8	6	8	62(15%)
6. 'At risk' - other	–	–	2	2	1	2	4	–	–	1	12(3%)
7. CJD type unclear/ CJD unlikely	1	1	–	4	1	1	2	–	–	–	10(2%)
8. Not CJD	2	1	4	7	7	1	1	–	3	–	26(6%)
9. Other	–	–	1	1	1	2	1	–	–	–	6(1%)
10. No longer considered 'at-risk'	–	–	1	–	–	–	–	1	–	–	2(0%)
Total	16	38	56	50	45	56	63	27	33	23	407(100%)

Investigation of surgical incidents may result in advice to remove surgical instruments from clinical use (to quarantine, destroy, or donate for research). Such advice is generally only given for instruments considered to be potentially contaminated with the CJD agent that have not undergone a certain number of cycles of use and decontamination since their use on an index patient. Hospitals are asked to consider sending any instruments to be permanently removed from use to the Surgical Instrument Store (held by the Health Protection Agency, Porton Down) for research. Since 2000, there have been 46 incidents in which instruments were permanently removed from use.

The Panel may advise contacting and informing some patients of their possible exposure to CJD in a surgical incident. Such advice is generally only given for patients who have definitely been exposed to

potentially contaminated instruments which have been used on risk tissues in certain index patients. The Panel may advise that some of these patients should be considered 'at-risk of CJD for public health purposes' and asked to take certain precautions (ie, not to donate blood or other tissues and to inform their medical and dental carers prior to any invasive procedures) in order to reduce the risk of transmitting the CJD agent further. Since 2000, 22 incidents have given rise to such advice. There are currently nine incidents in which 77 patients have been categorised as 'at-risk' by the Panel, according to the current risk assessment. Seven of these patients died before notification. A total of 31 patients are currently notified of their 'at-risk' status. Notifications are pending for another 31 patients. Three patients have not been notified due to local, clinical decisions.

The Panel has revised its advice on endoscopy and anterior eye patients. This has led to patients being denotified in 2006 and 2009. This resulted in reclassification of 38 patients from the 'at-risk' category; 32 in anterior eye surgery, two in invasive endoscopy.

Table 2. Panel advice to inform patients that they are 'at-risk' of CJD/vCJD: 1 January 2000 to 30 June 2009

Diagnosis of index patient	Procedure on index patient	Number of Incidents	Alive 'at-risk'			Died before notification	Total
			Notified	Not notified	Total		
Sporadic CJD	Brain biopsy	2	20	1*	21	2	28
vCJD	Appendectomy	1	–	2*	2	–	2
	Endoscopy and GI surgery	2†	3	1**	4	1	5
'At risk' vCJD	Endoscopy and GI surgery	4	8	30**	38	4	42
Total	–	9	31	34	65	7	77

*Local decision not to notify.

† The index patient in one of these incidents was a haemophilic plasma product recipient with evidence of vCJD infection.

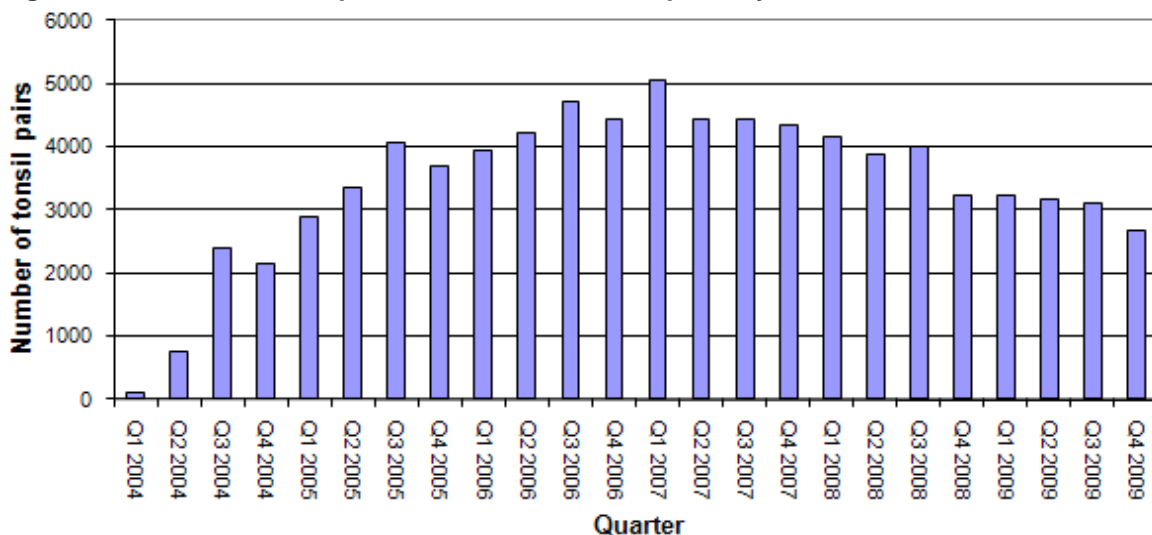
** Notification pending.

National anonymous tonsil archive for studies of detectable abnormal prion protein

The National Anonymous Tonsil Archive (NATA) continues to receive approximately 250 tonsil pairs per week (figure 1). The archive had received a total of 81,604 tonsil pairs up to the end of December 2009 from hospitals in England and Scotland. A further 3,000 tonsil pairs have been received from the Medical Research Council Prion Unit at the Institute for Neurology, National Hospital for Neurology and Neurosurgery. Therefore the total number of tonsil pairs in the archive was 84,604. The number of collection forms that were completed but no tonsil tissue collected was 2,395 (1,565 due to patient objection and 830 due to clinical pathology being requested).

Out of the 100 NHS Hospital Trusts that perform over 200 tonsillectomies per year in England, 91 have been recruited and are currently sending tonsil pairs to NATA on a regular basis. There are 120 hospitals sites within these trusts taking part in NATA. At present, approximately 50,000 tonsillectomies are performed annually in England. Figure 2 shows the number of tonsil pairs received from each Strategic Health Authority.

Figure 1. Number of tonsil pairs collected for NATA quarterly: Q1 2004 – Q4 2009



Just over 5,000 tonsillectomies are performed in Scotland each year. The project in Scotland, where there are 14 hospitals that each carry out more than 200 tonsillectomies per year, is being coordinated by Health Protection Scotland. All fourteen of these hospitals have been recruited and are collecting tonsils for NATA. The tonsil tissue is being transported to the Health Protection Agency in Colindale for inclusion in the archive. Figure 3 shows all hospitals in England and Scotland currently recruited in the study.

Figure 2. Tonsils pairs collected by Strategic Health Authority, January 2004 - December 2009

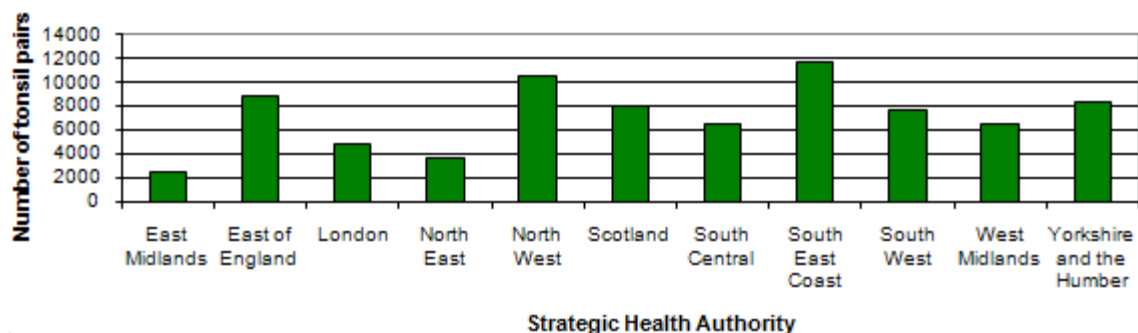
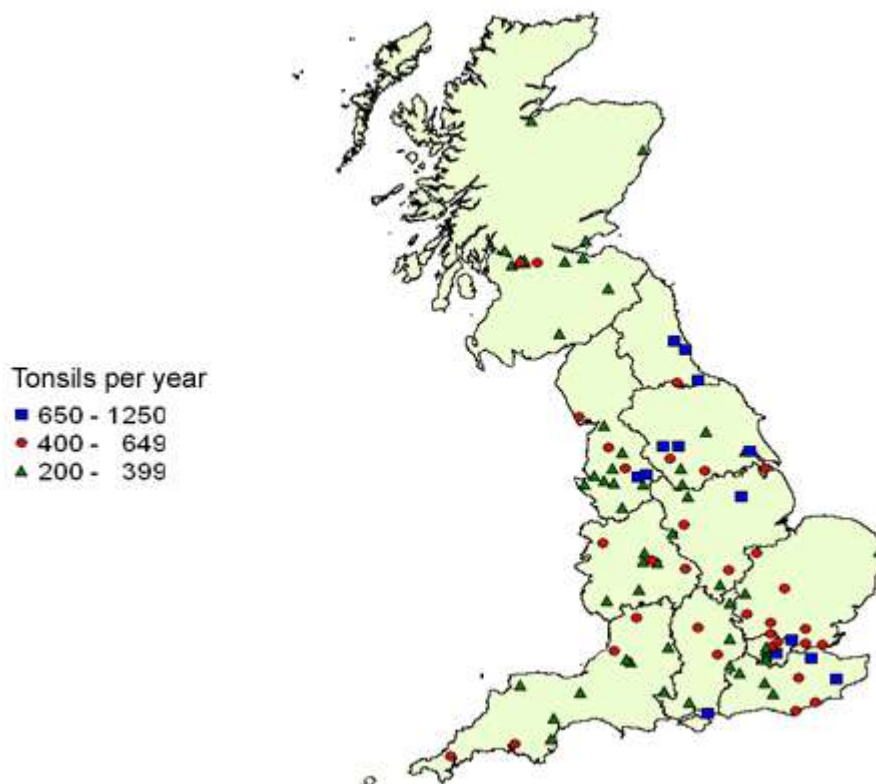


Figure 3. NHS Trusts and Scottish Hospitals currently collecting and sending tonsil tissue to the archive December 2009



Testing of homogenates of the tonsil tissue from the archive began at the end of January 2007. Two enzyme immunoassays (EIAs) are being used for the initial screening of the homogenates for the presence of abnormal prion protein. These EIAs allow the identification of any tonsils that need to be investigated further by the more specific tests of Western blotting (WB) and immunohistochemistry (IHC) [5].

References

1. The National Creutzfeldt-Jakob Disease Surveillance Unit, The University of Edinburgh. *CJD statistics*. Available at: <http://www.cjd.ed.ac.uk/figures.htm>.
2. The National Creutzfeldt-Jakob Disease Surveillance Unit, The University of Edinburgh. *Incidence of variant Creutzfeldt-Jakob Disease Onsets and Deaths in the UK January 1994 - December 2006*. Edinburgh: NCJDSU, 2 February 2007. Available at: <http://www.cjd.ed.ac.uk/vcjdqdec06.htm>.
3. HPA. *Biannual CJD update (2009/1)*. *Health Protection Report* [serial online] 2009; **3**(27): Emerging Infections/CJD. Available at: <http://www.hpa.org.uk/hpr/archives/2009/hpr2709.pdf>.
4. HPA. *CJD Incidents Panel* [online]. London: HPA, 2010. Available at: <http://www.hpa.org.uk/web/HPAweb&Page&HPAwebAutoListName/Page/1204031511121>.
5. Spongiform Encephalopathy Advisory Committee. *Combining evidence from tissue surveys to estimate the prevalence of subclinical vCJD*. London: SEAC, 2008. Available at: <http://www.seac.gov.uk/papers/paper100-2.pdf>.