

Laboratory Reporting of Pathogens Responsible for Infectious Intestinal Disease in Scotland

09 June 2008

All 32 human diagnostic clinical microbiology laboratories in Scotland (including designated reference laboratories) are invited to report voluntarily to Health Protection Scotland all their identifications of:

- Salmonella,
- Campylobacter,
- Pathogenic *Escherichia coli*
- Cryptosporidium and other gastrointestinal parasites
- any other gastro-intestinal organisms they consider to be of clinical or public health significance

HPS received over 10,000 such reports in 2007.

Data have until recently been reported on paper by post weekly. Increasingly laboratories report electronically via ECOSS (the Electronic Communication of Surveillance in Scotland). Currently 18 laboratories report on paper and 14 electronically

The data reported usually include the:

- organism name
- source laboratory (to which the specimen was originally sent)
- reference laboratory (when appropriate)
- specimen date received at reference and/or source laboratory
- case identifier (name or laboratory identification number)
- case age
- case gender

In order for HPS to receive a report:

- a) a case of infection must:
 - become in contact with a clinician, often a general practitioner (GP), or health protection professional, often an Environmental Health Officer (EHO)
 - be requested (and comply with the request) to submit a specimen (usually faeces) to a laboratory

- b) the laboratory must
- identify a pathogen, or submit the specimen to a reference laboratory which does
 - report the identification to HPSUsers of HPS's surveillance information based on laboratory reports should note that clinicians and others do not obtain specimens from cases in order to inform HPS's surveillance, but for clinical, or sometimes public health, reasons.

HPS does not therefore receive reports from all, or even a representative sub-set of, cases of any infection.

Patients are probably more likely to consult their clinicians, and clinicians are probably more likely to take specimens from patients if the patient is:

- severely ill
- not recovering quickly
- particularly vulnerable (e.g. the old, the young, the pregnant, hospital patients, and the immunocompromised)

Health protection professionals (e.g. consultants in public health medicine, environmental health officers, public health and infection control nurses) are more likely to take specimens from cases and contacts of cases if the case or contact is:

- at higher risk of transmitting infection (e.g. food-handlers, pre-school children, health-care workers, and those whose personal hygiene may be unreliable)
- part of an outbreak

These groups are therefore likely to be over-represented in HPS's surveillance output.

Laboratories do not test every specimen submitted to them for all pathogens. They tend to concentrate their efforts on what they deem to be the most likely pathogen. Different laboratories have different protocols for whom they test for what pathogen. The frequency of identification of any pathogen is directly related to these protocols. For example, if different laboratories test different numbers of specimens from outbreaks for norovirus (NV), they will report different numbers of identifications of NV for the same incidence in the population. Similarly, if laboratories look for rotavirus only in children, then HPS's surveillance output will be unhelpful in estimating the incidence of rotavirus infection in adults

The sensitivity of laboratories' diagnostic techniques may also differ:

- between pathogens,
- over time
- between laboratories

The consequences of these differences are that

- the relative proportion of pathogens reported to HPS may not reflect their relative proportions in the population
- changes over time may reflect changes in the efficiency of identification rather than in changes of incidence in the population
- geographical differences in reporting rates to HPS may reflect different ascertainment by laboratories rather than different population rates.

It is likely that the discrepancies described are less for pathogens which cause severe disease, because cases are more likely to:

- seek medical help,
- have a specimen requested and obtained by the clinician
- have a pathogen sought, identified, and reported by the laboratory

Despite its limitations, surveillance based on voluntary laboratory reporting is, when interpreted with caution, an invaluable tool for health protection providing information on trends in incidence and allowing the identification of outbreaks.