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Waterborne disease outbreak surveillance system in France: Perspectives for nationwide surveillance

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Outbreaks of infectious waterborne diseases are still a public health concern in developed countries [1-6]. France is also concerned by WBDO occurrence [7, 8], but to date, because of the absence of a nationwide specific surveillance system, the detection of these events is mainly based on the voluntary reporting of clusters of AGI by general practitioners to health authorities. The number of WBDO is thus most likely underestimated. In this context, an integrated approach to detect WBDO relying on the identification of medicalized AGI cases from the French health administrative database and drinking water networks (DWN) from French ministry of health database was developed [9] and tested in a pilot study. Each detected outbreak was investigated regarding environmental criteria during the days before the onset of the outbreak: results on bacterial water monitoring, weather (e.g. heavy rain), technical incidents in the drinking water system (e.g. chlorination breakdown, alarm malfunction). Sixty-seven potential WBDO were detected in 2014 and 2015 in the 7 french administrative districts of the pilot study. The combined population served by a DWN implicated in a WBO during the period was 914,599 inhabitants. Comparatively, only 2 WBDO had been detected and reported to the health authorities at the time of their occurrence. Four levels of strength of association have been defined based on epidemiological and environmental criteria: Strong, probable, possible and undetermined. The results of the pilot study highlight the public health utility of the implementation of a nationwide WBDO surveillance system in France based on data routinely collected by the Health Insurance. A web-application, named “EpiGEH”, was also developed to support the surveillance system. Such a specific surveillance system should help health authorities to formulate recommendations regarding the management of drinking water systems and propose appropriate preventive measures, in accordance with the water safety plans.

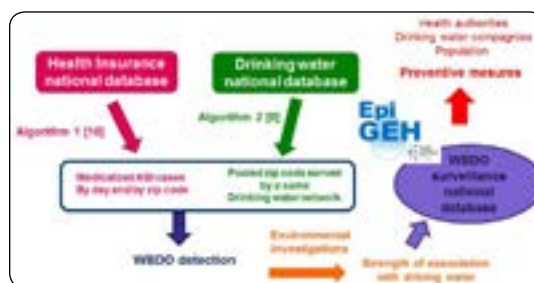


Figure: Waterborne disease outbreak surveillance system

Recent Publications

1. Craun, G.F., et al., Causes of outbreaks associated with drinking water in the United States from 1971 to 2006. *Clin Microbiol Rev*, 2010. 23(3): p. 507-28.
2. Hrudey, S.E. and E.J. Hrudey, *Safe Drinking Water : Lessons from Recent Outbreaks in Affluent Nations*. 2004, London: IWA publishing. 486.
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4. Nazareth, B., et al., Surveillance of waterborne disease in England and Wales. *Commun Dis Rep CDR Rev*, 1994. 4(8): p. R93-5.
5. Murphy, H.M., et al., A systematic review of waterborne disease burden methodologies from developed countries. *J Water Health*, 2014. 12(4): p. 634-55.
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7. Beaudéau, P., et al., Lessons learned from ten investigations of waterborne gastroenteritis outbreaks, France, 1998-2006. *J Water Health*, 2008. 6(4): p. 491-503.
8. Mouly, D., et al., Description of two waterborne disease outbreaks in France: a comparative study with data from cohort studies and from health
9. Bounoure, F., et al., Syndromic surveillance of administrative databases. Epidemiology and acute gastroenteritis based on drug consumption. *Infection*, 2016. 144(3): p. 591-601. *Epidemiol Infect*, 2011. 139(9): p. 1388-95.
10. Coly, S., et al., Waterborne disease outbreaks detection: an integrated approach using health administrative databases. *Journal of Water and Health*, 2017. Available Online 25 March 2017.

Biography

Damien Mouly has worked as epidemiologist at the French National Public Health Agency since 2004. He is qualified in pharmacy, drinking water treatment engineer and is university doctorate of ecology of human health. He is specialized in waterborne disease and in surveillance system. He has worked on chemical risk (disinfection by-products, arsenic) and microbiological risk associated with drinking water. He works at the head of the regional office Occitanie of the French Public Health Agency (Toulouse) and ensures the national coordination of the implementation of waterborne disease outbreak surveillance.

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