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Opportunities lost may be the greatest cost of CPE outbreaks

Sir,

Carbapenemase-producing Enterobacteriaceae (CPE) outbreaks are reported internationally with increasing frequency, often associated with antimicrobial-resistant infections that are challenging to treat [1,2]. It is unsurprising, therefore, that considerable efforts are being made to understand both the sources and epidemiology of these incidences [3–5]. Further focus has been placed on calculating the economic costs of these outbreaks. Notably, Bartsch *et al.* found that the financial burden of CPE in the USA was higher than that attributable to many chronic and acute diseases [6]. Otter *et al.* performed a comprehensive audit of costs arising from a 40-patient CPE outbreak across five hospitals in the UK, reporting both actual and opportunity costs that accrued in 2015 [7].

Using an approach analogous to Otter *et al.*'s, we completed a retrospective review of accrued costs relating to a comparable 2015 CPE outbreak involving 27 patients in Limerick, Ireland. Although less comprehensive than the UK study, and focused somewhat more on patient experiences of CPE diagnosis [8], the direct economic comparison on an almost like-for-like basis (similar patient numbers) was insightful. Across shared parameters (e.g. anti-infective costs, screening, contact precautions, ward monitors and hydrogen peroxide vapour decontamination), the Irish costs amounted to €1,375,000, representing €835,000 more than the UK costs, despite 33% less Irish patient involvement. Forensic accounting may determine where the greatest disparities in cost are, although it is apparent that pricing of drugs, consumables and decontamination are reasonably similar.

Otter *et al.* described reduced capacity to perform elective surgical procedures and 840 bed-day closures as the largest contributors to loss of hospital income subsequent to their CPE outbreak, reflecting losses of €349,000 and €244,000, respectively [7]. In Limerick, 473 lost bed-days were recorded. Unlike UK hospitals, we are unable to attribute loss of income specifically. However, the impact of such reduced capacity is evident, with official statistics from the Irish Government reporting hospital in-patient and day-case waiting lists in excess of 80,000 in March 2018. With CPE now endemic in many Irish hospitals [2], it seems reasonable to predict ongoing budgetary requirements, dedicated isolation facilities and loss of bed-days. It is the latter that concerns us most, as delayed access to hospitalization increases time to treatment, and reduces those critical windows of opportunity in which elective or acute care can be most effective.

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Inform rather than ambush CPE patient contacts

Sir,

Carbapenemase-producing Enterobacteriaceae (CPE) are endemic in many Irish hospitals [1], resulting in CPE being declared a public health emergency by the Irish Government in October 2017 [2]. Subsequently, an expert group mandated that all CPE contacts (those exposed to CPE-positive patients) discharged to the community should be advised of their status retrospectively and prospectively from September 2018. Prior to this, no agreed national health system approach existed.

However, beginning in 2011, St John's Hospital (SJH), a voluntary hospital in Limerick with 89 inpatient and 10 day-care beds, proactively disclosed CPE exposures. In the 18-month period since January 2017, eight exposure incidents have resulted in 38 direct patient contacts. Of those, 16 CPE contacts were discharged before exposure was confirmed. Each of these contacts was informed via proforma letter accompanied by a CPE factsheet, followed by a telephone call. It was notable that being informed was universally appreciated. Each person availed of screening opportunities and, fortunately, none of the contacts tested positive.

Conversely, 13 patients presented at SJH as CPE contacts, having been exposed to the bacteria in another healthcare facility. They were not advised using the process outlined above, but were advised of their status upon presentation for day-case procedures between January and August 2018. Each patient met individually with an infection control nurse. Reaction to learning that they were at risk of colonization was unanimous annoyance at not being informed of their exposure to CPE, and questioning of the reasons why. Despite this, all underwent tests to determine whether colonization had actually occurred.

Declaration of the Irish public health emergency is probably prudent. The decision to inform patients of CPE status is appropriate. While there is relatively scant insight regarding the impact of CPE diagnosis and subsequent treatment on patients' lives, as part of a quality improvement programme, we previously sought to understand the experiences of such patients [3]. Arising from those overwhelmingly negative patient perspectives, we recommend that patients should not be confronted with unexpected bad news regarding CPE exposure in what may potentially be perceived as an intimidating clinical environment, and certainly not unless a suitably trained professional is present to provide any necessary information and counselling. While arguably not ideal in every case, providing information to affected people while they are at home, or at least in familiar and comfortable surroundings, represents a compassionate and patient-centred approach. This approach needs to continue, however, with provision of understandable information regarding the implications of test results for those patients found to be CPE positive, allied to care and support by appropriately resourced teams.

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