among the control strains. The absence of AzR strains suggests that azithromycin can be used successfully for MDA in Vanuatu.

Type: Oral Presentation

Pregnancy associated listeriosis in England & Wales: a 21 year review of enhanced surveillance data

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Background: Listeriosis is a severe food-borne disease that rarely occurs in humans and primarily affects the elderly, persons with impaired immunity, pregnant women and unborn or newborn babies. Pregnant women are 18 times more likely to develop the disease following consumption of food contaminated with *Listeria monocytogenes* and this is because during pregnancy, the immune system is modulated. Whilst pregnant women with listeriosis tend to have mild clinical symptoms or be asymptomatic, the infection can have severe outcome for the foetus or newborn infant including miscarriage, still birth, neonatal sepsis and meningitis.

Methods & Materials: We examined cases of pregnancy associated listeriosis reported to the enhanced surveillance system in England and Wales from 1990 to 2010 to identify risk factors that may influence outcome. Cases were defined as pregnancy associated if *L. monocytogenes* was isolated from a pregnant woman or newborn infant aged less than 28 days.

Results: Of the 3088 cases reported, pregnancy associated listeriosis accounted for 462 cases (15%) and 315 of these resulted in a live birth. The presence or absence of maternal symptoms was known for 259 cases and 68% (176/259) reported having symptoms during pregnancy.

Several factors were identified to affect the severity and outcome of listeriosis in pregnancy in both mother and child including: presence or absence of maternal symptoms, gestational age at onset of symptoms, onset of infant illness (early or late) and clinical presentation in the infant (meningitis or septicaemia).

The presence of maternal symptoms halved the likelihood of a live birth and increased the probability of the infant developing a late onset illness.

Gestational age at time of onset significantly affected the outcome of the pregnancy and the probability of infant survival with the odds increasing as the pregnancy progresses. Early onset illness also doubled the chances of infant survival.

Although the clinical presentation could be determined by early or late onset of infant illness, the presentation did not significantly affect the likelihood of survival.

Conclusion: This presentation will report a review of pregnancy related cases over a 21 year period and highlight significant risk factors that should inform the management of listeriosis in pregnancy.

Taking antimicrobial stewardship initiatives to the next level: Development of a serious prescribing game for acute care

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Background: Increasing antimicrobial resistance has been identified as a global threat to health. Antimicrobial stewardship measures to improve the quality of antimicrobial prescribing have been implemented with varying success. Whilst prescriber knowledge and skills are important, attention to behavioural and social aspects seems essential to sustain improvement initiatives.

Serious games and gamification have been introduced in other settings to maintain engagement with desired behaviours. We report the development of a serious smartphone prescribing game to support the prudent use of antimicrobials in acute care prescribers.

Methods & Materials: In collaboration with a commercial game company, a decision tree of prescribing options was developed for a series of virtual patients. Prescribers iteratively receive clinical information for each patient, prompting diagnosis and treatment decisions for each case (Figure 1). Clinicians can use 1) oral antibiotics, 2) broad- or 3) narrow-spectrum intravenous (IV) antibiotics, 4) request further tests or 5) discharge without treatment.

The game provides immediate feedback on performance, considering clinical accuracy and impact on other professionals and wider hospital environment. To sustain the focus on the game, elements such as timers, scores and leaderboards, together with increasing case difficulty are used.

Delayed consequences of prescribing decisions are made explicit for the players; for example, using broad-spectrum antibiotics too frequently will lead to patients attending with antibiotic-associated diarrhoea, or prolonged use of IV antibiotics will result in cannula-site infection cases.

Results: A multi-method approach will be used to evaluate the game. An interrupted time-series analysing antimicrobial consumption (daily-defined doses per 100 occupied bed-days per year) data before and after game introduction will identify vari-

Figure 1. Screen capture of prototype.