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Appendix: Content Summary of Selected Best Papers 2021 IMIA Yearbook Section Public Health and Epidemiology Informatics

Zheng L, Wang O, Hao S, Ye C, Liu M, Xia M, Sabo AL, Markovic L, Stearns F, Kanov L, Sylvester KL, Widen R, McElhinney DB, Zhang W, Liao J, Ling XB

Development of an early-warning system for high-risk patients for suicide attempt using deep learning and electronic health records

Transl Psychiatry 2020;10(1):72

The paper of Zheng et al. reports a study focusing on tackling suicide attempt. It is a public health focused paper combining health informatics and biostatistics methods and which are applied to stratify patients within a cohort in order to identify those at risk of suicide. They developed an early-warning system for high-risk suicide attempt patients through the design and implementation of a population-based risk stratification surveillance system. A Deep Neural Network (DNN) model was trained for the prediction, stratification, and calibration. Then a Local Interpretable Model-agnostic Explanations algorithm was utilised to interpret the risk stratification results. As of result, a total of 117 features were significant in the predictive model; the DNN on the EHR-based data, enabled finding that suicide attempts patients were more likely to be gin: age groups of 6–54, diagnosed mental health conditions or pain, to have suicide attempts, treated by psychotropic medications, and have open wounds or injuries due to unspecific reasons. The findings of the study enable early interventions and appropriate treatments to mitigate suicide risk.

Roope LSJ, Tonkin-Crine S, Herd N, Michie S, Pouwels KB, Castro-Sanchez E, Sallis A, Hopkins S, Robotham JV, Crook DW, Peto T, Peters M, Butler CC, Walker AS, Wordsworth S

Reducing expectations for antibiotics in primary care: a randomised experiment to test the response to fear-based messages about antimicrobial resistance

BMC Med 2020;18(1):110

The aim of this study is to test the likely impact of fear-based messages, with and without empowering self-management elements, on patient consultations or antibiotic requests for influenza-like illnesses, using a randomised design. To do so, they relied on the use of an on-line survey of adult members of the UK general public. They proceed to the randomisation of patients, to receive one of three different messages about antibiotics and Antimicrobial Resistance. As of results, they have been able to demonstrate that empowering patient could help to better involve them in their care process and make a better decision regarding Antibiotics related issues. The study concludes that while fear-only messages could be effective in public campaigns to reduce inappropriate an- tibiotic use, they should be combined with messages empowering patients to self-manage symptoms effectively without antibiotics.

Degeling C, Carter SM, van Oijen AM McAnulty J, Sintchenko V, Braunack-Mayer A, Yarwood T, Johnson J, Gilbert GL

Community perspectives on the benefits and risks of technologically enhanced communicable disease surveillance systems: a report on four community juries

BMC Med Ethics 2020;21(1):31

The paper focuses on assessing how routinely using Whole Genome Sequencing (WGS) and Big Data technologies to capture more detailed and specific personal information could be perceived among communities in two demographically different Sydney municipalities and two regional cities in New South Wales, Australia (western Sydney, Wollongong, Tamworth, eastern Sydney). Four community juries were created by recruiting participants at each study site by an independent professional research service. The aim was to elicite the views of well-informed community members on the acceptability and legitimacy of making pathogen WGS and linked administrative data available for public health research using this information in concert with data linkage and machine learning to enhance communicable disease surveillance systems. Participants across all four events strongly supported the introduction of data linkage and pathogenomics to public health research under current research governance structures. This study demonstrates that when public is well informed, here a jury proxy is used, they are likely to support routine collection, linkage and use of administrative and pathogenomics data for the purposes of public health research.