0672 A FUNCTIONAL DATA ANALYSIS APPROACH FOR MODELLING AND PREDICTING INJURY INCIDENCE RATES: AN APPLICATION TO FALLS

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10.1136/ip.2010.029215.672

To date, much falls epidemiology data describing the magnitude of, and trends in, the problem has largely been descriptive in nature. It is important that good statistical models are used to generate accurate and reliable information about predicted future injury rates to inform public health investment decisions. It is critical, therefore, that such predictions are derived using the best available statistical models to minimise possible errors in the forecast. Functional data analysis (FDA) approaches have been developed to improve long-term predictions but are yet to be widely applied to injury epidemiology or the analysis of injury trend data. Using the specific example of modelling age-specific annual incidence of fall-related severe head injuries of older people during 1970–2004 and predicting rates up to 2024 in Finland, this talk will explain the principles behind FDA and demonstrate their superiority over the more commonly reported Poisson and negative binomial modelling approaches in terms of prediction accuracy. Application of the FDA approach to this data shows that the incidence

of fall-related severe head injuries in Finland would increase by 2.3–2.6 fold by 2024, compared to 2004. The FDA predictions have 43% and 30% less prediction error than Poisson and negative binomial predictions, respectively, when compared to actual trend data. In summary, FDA provides more accurate predictions of long-term incidence trends than commonly used methods. The production of FDA prediction intervals for future injury incidence rates gives likely guidance as to the likely accuracy of these predictions.