E.A. SADOWSKI, S.T. DOHERTY. Time-series analysis and data mining: Learning recurrent adverse health patterns to detect health deterioration. Gerontechnology 2010;9(2):324; doi: 10.4017/gt.2010.09.02.178.00 **Purpose** There is a growing call for providing efficient and cost-effective methods of home care support to the increasing elderly population who wish to remain living independently in their home as they mature[1]. Large numbers of homecare clients live alone and receive only a few visits a week from health care provides, who themselves tend to be isolated in their work. This environment poses challenges for the provision of health services, including coordinating communication and information among health providers and the monitoring of patient safety and status between visits. Recently, time-series mining presents many challenging issues for researchers. One important application is for the purpose of remotely monitoring patients[2]. This arduous task requires analyzing large amounts of time-series data in efforts to learn usual patterns. These complex datasets may possess 'hidden information' that promises to be of clinical value (i.e. forecasting a hypoglycemic episode). Any deviation from an individuals' acquired profile is considered to be an unexpected situation. This work is part of efforts that aim to provide smart homes and medical information systems to assist people to remain living independently for as long as possible. Health deterioration usually involves behavioural disorders, from forgetfulness in daily activities and slowness in executing simple actions, to a global decrease in the ability to execute activities of daily living. The purpose of this paper is to present multidimensional time-series data for the purpose of learning meaningful patterns to be used in an automated activity monitoring system. This is useful in a monitoring capacity, such as in-home health care, when attempting to detect unusual trends or behaviours observed from several types of sensors. Practical applications are intended for care providers and are meant to complement the traditional continuum[3]. Information gathered from such networks may serve as one component of a patient's care plan or health management strategy. The combination of data and communication, and professional care will produce the behavioral and medical outcomes required for individuals to better self-manage their health outside of conventional health service institutions. **Method** The method involves a unique combination of metrics including: second-by-second traces of individuals' physiological conditions (namely heart-rate and blood glucose), location via Global Positioning System, and behavioural factors[4]. Data from a sample of 40 individuals from Toronto, Ontario tracked for three continuous days will be utilized. **Results & Discussion** We expect that results from this research will allow the possibility to better (i) anticipate the state of health at extreme ages, (ii) forecast changes in health at specific ages over time, (iii) simulate the effects of specific interventions, and (iv) determine the sensitivity of outcomes to a range of interventions. It is also expected that the homecare industry would be well served by the passive monitoring techniques presented.

References

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