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## CONFERENCE ABSTRACT

# Integrating Primary Health and Social Care in the Australian setting: an initial approach to risk stratification

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Internationally, sophisticated risk stratification models have been developed using routinely collected data from large organisations that provide care in both community and hospital settings. This paper outlines a simple approach in the Australian context, where federal and state governments have separate data for community and hospital care, with limited opportunities for data linkage.

On the NSW Central Coast, just north of Sydney, the Central Coast Local Health District, CCLHD, is embarking on a 10 year program to integrate primary health and social care for vulnerable older people in the community. A key action is to provide integrated care for people at greatest risk of some deterioration in their health state.

Practice change

**Aim:** To assess the utility of routinely collected hospital data for risk stratification. In the first year of the program, the risk is defined as a person with a high risk of being hospitalised in the next 12 months.

**Target Population:** The Central Coast area of New South Wales, Australia, has a population of about 330,000 people, with 19% aged 65 years and over. Each year, about 10,000 people of this age have at least one unplanned hospital admission to a CCLHD hospital.

There are over 400 General Practitioners, GPs, on the Central Coast, working from about 100 practice locations - with some solo practices to large group practices, operating as separate small business entities. People do not register for a GP, though nearly all people by 75 years of age have a regular GP. General practices also vary by the number and age profile of the patients they see in a year.

**Key Findings:** The analysis of 5 years of hospital data demonstrated patterns in service delivery for the older age group eg for each year's cohort of 10,000 people with at least one admission, about 2700 people (27%) have at least one hospital admission in the following year.

Knowing each person's nominated GP allowed some exploration of patterns of service use by GP. Some GPs had few patients admitted each year, and some GPs had many. It is likely this variability reflects differences in practice profiles of age distribution. There was consistency in these patterns of service use by GP over time, and also by general practice.

The analysis of comorbidities allowed categorisation of the age group into those with 2 or more comorbidities - about 3500 people from a one year cohort have 2 or more chronic diseases. For this group of 3500 people, about 1500 people, or 40%, have a hospital admission in the following year.

This approach was used to identify a small number of general practices in a low socio-economic status area, with an initial total cohort of about 600 people for a proof of concept of integrated care.

**Discussion:** A risk stratification model needs to be linked with an effective intervention to improve the health of a population.

Regression to the mean, when assessing whether a trial worked – it is important to have an understanding of patterns of service delivery over time, if they exist. Analysing hospital data, by general practice, allows contemporaneous analyses of other practices with similar activity and socio-economic profiles for comparison.

Risk stratification models and c-statistics – the c-statistic is a useful measure of goodness of fit available for some regression models. It is not the only measure, and others should be considered. This approach using hospital data does not have a goodness of fit measure per se.

Positive Predictive Value – Of equal importance is how well the model works when it is applied to the population of interest. If a model selects 100 people considered at high risk of hospitalisation, and 25 people are actually admitted to hospital, this represents a positive predictive value, PPV, of 25%. The PPV is influenced by the underlying risk of hospitalisation in your target population. Our 40% prediction of hospitalisation can be compared with the PPV of other risk stratification models.

**Conclusion:** Further work is underway to apply a regression model to hospital data to facilitate comparisons with other risk stratification models reported in the literature, and quantify the incremental gains from increasingly sophisticated approaches to patient selection.

Further work will also explore the gains from linking hospital data with primary care data.

Using hospital data compares well with other models, and is an easily transferable, low tech approach to patient selection. A series of criteria for patient selection is a familiar way of doing business in many clinical settings.

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**Keywords:** risk; stratification; selection; prediction; aged

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