Commentary

Benefits of Population Segmentation Analysis for Developing Health Policy to Promote Patient-Centred Care

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Introduction

The philosophy of patient-centred care requires a paradigm shift away from fragmented institution-centred care to integrated care models such as care teams that develop and implement a care plan tailored to meet patient needs.[1] While no 2 patients are exactly alike, it is not feasible to focus at the granular level when developing health policies that promote patient-centred care. Segmenting the population into relatively homogeneous, distinct subgroups promotes the development of care models tailored to similar groups of people rather than individuals.[2,3]

Population segmentation, with the aim of optimising healthcare services, originally evolved from market segmentation. Widely applied in the field of business, market segmentation involves tailoring product features for different consumer types.[4] Population segmentation analysis can happen at various levels—at the macro (e.g. nationwide population), meso (e.g. diabetic patients), and micro levels (e.g. individual adverse event risk stratification)[3]—with the segments themselves being derived either through expert inputs or post-hoc using statistical methods applied to empirical data.[4]

In order to prepare for an ageing population in Singapore,[1] initiatives to integrate care through population segmentation have already been started, such as those by the Agency for Integrated Care.[5] As resources are finite, targeted and high value interventions that are enabled by population segmentation analysis have become increasingly relevant. In this article, we discuss the specific benefits of population segmentation analysis for the provision of efficient patient-centred care. These include the facilitation of healthcare service planning, promoting the evaluation of health service innovations and improving care integration.

Healthcare Service Planning

Various definitions of needs exist.[6] In the healthcare context, a need is defined as the capability to benefit from healthcare.[7] Benefits can be quantified in various ways depending on the policy objective,[8] for example, cost-effectiveness, number benefiting[7] or decreased probability of transitioning into a worse health state. The goal of the healthcare system, therefore, is to match services to healthcare needs. Failure to meet the healthcare needs of patients typically leads to worse clinical outcomes and may potentially increase health service utilisation in the long-term.[7] For example, patients with atrial fibrillation on warfarin are at increased risk of either embolic stroke or severe bleeding with suboptimal anticoagulation management (i.e. international normalised ratio outside the target range).[9] Providing services beyond needs are not associated with improved outcomes (and may be associated with avoidable complications) but is surely associated with increased costs.[10] Therefore, it is important to tailor healthcare services to patient needs.[7,11]

Segmenting the population facilitates the efficient development of service packages that are based on common sets of needs associated with each segment. Understanding the needs of distinct population segments may also help ease the identification of frequently unmanaged needs by comparing services recommended to individuals in a particular segment with the typical service packages received by patients in that segment. Examples of healthcare needs assessment tools include EasyCare,[12] Interrai[13] and the Simple Segmentation Tool which is a locally developed tool.[14] Insights into the number of individuals in the various segments and current patterns of care can help policymakers plan and allocate healthcare resources at a population level.[15] In addition, policymakers will also be able to evaluate transition rates of patients between population segments and characterise risk factors for adverse transitions as potential targets for policy intervention.

Programme Evaluation

The evaluation of efforts to improve health services such as integrated care[4] is complicated by the relationship between patient characteristics and clinically relevant outcomes such

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as mortality, healthcare utilisation costs[16] and transition rates into worse health states.[17] Population segmentation analysis enables health outcome tracking for groups of patients with relatively homogeneous prognosis and similar responses to healthcare. Examples of patient segmentation schemes intended to promote programme evaluation include Kaiser Permanente's Senior Segmentation Algorithm patient groups[18] and the Bridges to Health model patient segments by Lynn et al.[2]

Care Integration

Integration of care can happen both horizontally and vertically. Horizontal integration refers to the provision of various allied health services, in addition to medical care by physicians, to address patients' manifold healthcare needs.[19] Vertical integration involves linkages across various venues of care from primary care clinics to tertiary general hospitals. Integrated care often involves the provision of a package of healthcare services, supported by benchmark tools such as guidelines and care pathways.[1] Segmentation may also help to inform policymakers on deciding which services should be included in a healthcare service package for a particular population segment. By identifying the combination of health and social service needs within different population segments, integrated packages of care can then be tailored to meet the needs of patients in their respective segments. For example, Valkronic is an integrated care programme in Spain for patients suffering from long-term conditions.[3] In this programme, patients are placed into different hospitalisation risk segments, with each receiving different service packages. Patients at the highest risk segment receive personalised education as well as tele-health services such as communication with a primary care physician via tablet computers and disease-specific biometric tele-monitoring devices. Meanwhile, patients in the lowest risk segment receive communication and education through web portals. The programme has been reported to improve clinical outcomes such as reduced utilisation of emergency care services.[3]

Furthermore, an important component of segmentation is that it logically includes social needs associated with clinically relevant outcomes. For example, loneliness is highly predictive of healthcare utilisation among the elderly,[20] particularly for those with multiple chronic conditions. Befriending services has the substantial potential to reduce healthcare utilisation for this population group and thus, should be made available in the healthcare service package delivered to this group.

Conclusion

With an ageing population, the needs for health and health-related social services in Singapore are rapidly changing. Understanding the nature of these needs through population segmentation analysis holds significant potential for helping Singapore weather the "silver tsunami". Thus, it is recommended that healthcare institutions utilise population segmentation analysis to plan for tailored healthcare services by leveraging on pre-existing resources such as the National Electronic Health Records, as well as investing in both academic and institutional expertise to support segmentation type work.

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