

## LETTER TO THE EDITOR

# Demand-based models and market failure in health care: projecting shortages and surpluses in doctors and nurses

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**Abstract:** Models for projecting the demand for and supply of health care workers are generally based on objectives of meeting demands for health care and assumptions of *status quo* in all but the demographic characteristics of populations. These models fail to recognise that public intervention in health care systems arises from market failure in health care and the absence of an independent demand for health care. Hence projections of demand perpetuate inefficiencies in the form of overutilisation of services on the one hand and unmet needs for care on the other. In this paper the problems with basing workforce policy on projected demand are identified and the consequences for health care system sustainability explored. Integrated needs-based models are offered as alternative approaches that relate directly to the goals of publicly funded health care systems and represent an important element of promoting sustainability in those systems.

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Scheffler and Arnold (2018) present a model for projecting the demand for and supply of doctors in nurses in OECD countries based on the explicit assumption of current trends continuing and the implicit assumption that the objective of health care systems is to meet (all) demands for health care. In many cases, publicly funded health care systems are responses to market failure in health care and recognition that satisfying demands is unlikely to lead to either efficiency or equity in health care systems. Projections of demand perpetuate inefficiencies in the form of overutilisation of services on the one hand and unmet needs for care on the

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other. Moreover, the particular characteristics of health care mean that no independent demand curve for health care exists. Instead individuals express demands for health status improvements (or reductions in the risk of health status deterioration) and rely on their agents to prescribe what care is required to achieve these health status improvements. However, those agents also play the role of care providers and earn incomes from providing that care. As a result, demand projections are fundamentally linked to, and certainly not independent of, supply.

Although Scheffler and Arnold (2018) recognise that the demand for health workers is *derived* from the demand for health care, they do not specify a demand for health care function or base their empirical projections of workforce demand on any notion of health service demand. Instead they use a conceptual model in which workforce demand is determined directly by the fiscal capacity of governments (or national income), household incomes and changes in demographic and epidemiological conditions, as if policy objectives of governments are concerned solely with the number of doctors as opposed to the quantity, quality or outcomes of services that doctors produce. The introduction of medical technology or the substitution of other providers for doctors in the production of services are examples where projections of the demand for doctors might move in the opposite direction (or at least at a different rate in the same direction) as the demand for health care. Omitting any notion of the demand for services from the demand for health workers means that plans would be based on the number of providers required to deliver a fixed level of service currently (or in the past) even though fewer providers will be required in the future. This would generate a surplus of providers to meet the expected level of service demand and the potential for provider groups to induce additional demand to meet workload (and income) expectations.

A second problem with the empirical model used in the projections is that despite the authors incorporating ‘demographic and epidemiologic conditions’ in the conceptual model for the demand for health workers, the empirical model includes only demographic conditions, as proxied by the percentage of the population aged 65 or older. While individuals in this older age group can reasonably be expected *on average* to have greater demands for health care than individuals in the under 65 age group, there is no reason to believe that this difference is in any way meaningful for the future planning of health care and/or health care providers. Health levels in older age groups have, on average, increased over many years with an increasing proportion of older age groups reporting their health as good and a lower proportion reporting limiting health problems (Mason *et al.*, 2015). If demands for health care providers are projected to increase in line with a shifting balance of the population in older age groups we might want to question what the resulting increased number of doctors would be doing with these (or perhaps other) age groups (Birch *et al.*, 2013).

Other authors have followed demand-based approaches to projecting or planning health care expenditures and workforces. Di Matteo (2010) used regression analysis to identify factors associated with public health care expenditure growth

in Canada between 1965 and 2008. The estimated equation was used for projecting future expenditures. However, the analysis was not based on any clear conceptual framework. For example, physician numbers were not included in the model, though physicians generate a large proportion of health care utilisation and hence expenditures. In further work, the same author (Di Matteo, 2014) included physician expenditure as an explanatory variable in an analysis of health care expenditure. He concluded that ‘physician numbers alone are a modest policy concern when it comes to restraining health costs and other factors such as utilisation and fees are more important’. However, this assertion fails to recognise that physicians influence utilisation in response to, *inter alia*, changes in fees and other health care policies.

Basu and Pak (2016) propose following a demand-based approach to projecting the health workforce arguing that need-based workforce planning will not maximise social welfare because of ‘(some) needs that will not seek service’. They claim that where need-based models are adopted, ‘over-supply...is likely’ resulting in inefficiency. They argue that a demand-based approach is required in order to incorporate ‘personal preferences or other socioeconomic factors’. However, this is justified through adopting an assumption that ‘the planner wishes to supply HHR at a level that will maximize the aggregate welfare, which we take as the sum of the individual utilities’. Matters such as the inverse care law (Tudor Hart, 1971) and deploying resources in ways that maximise the impact on the health of the population are of no interest to such a planner who cares only about maximising welfare through meeting demands, even though demands will be determined, *inter alia*, by the prevailing distribution of wealth in the population.

Demand-based projections may provide a useful tool for health care systems aimed at responding to demands for care irrespective of the nature of those demands and with little concern for unmet needs for care. However, such approaches underlie the rapidly escalating costs of publicly funded health care systems and threats to the sustainability of those systems (Birch *et al.*, 2015). Demand-based approaches will not help policy-makers address challenges like the inverse care law (Tudor Hart, 1971) and meeting needs for care in the population because it is precisely the use of demand-based approaches that underlie these challenges. Shipman *et al.* (2004) noted that the projected rate of increase in the number of paediatricians in the United States far exceeded the projected rate of increase in the number of children. The recommended response for paediatricians (i.e. suppliers of paediatric care) was not to reduce the numbers of paediatricians being trained but to increase demand for paediatricians services by (a) increasing the population being served (by increasing the age group covered), (b) eliminating other sources of care for children and (c) finding new things to do for children.

Although population needs-based approaches for distributing health care resources (or slicing the health care cake) have been adopted in several countries, little if any attention has been given to adopting a similar population needs-based focus for projecting or planning health care resources (or the size of the health care

cake) (Tomblin Murphy *et al.*, 2016). Population needs-based approaches for planning health workforce have been developed and applied to specific programmes and settings. These methods are based on the explicit notion of integrating the planning of health care services, the workforces to deliver those services and the finances required to support those workforces. Moreover, by integrating service planning with workforce planning, alternate workforce models (or skill mixes) can be considered and interdependencies between different provider groups explored (Birch *et al.*, 2015).

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