

## LETTER TO THE EDITOR

### Response to Stephen Birch

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Submitted 28 March 2018; accepted 5 June 2018; first published online 2 August 2018

We thank Professor Birch for his thoughtful comments on our paper. He raises a large number of interesting points though many are beyond the scope of our paper. We will discuss a few of the most salient issues he raised in this reply.

In the first paragraph of his comment, Professor Birch states, ‘Projections of demand perpetuate inefficiencies in the form of over utilization of services on the one hand and unmet needs for care on the other’. This statement alludes to the fundamental difference between demand and need projections. Professor Birch is right to point out that even if supply keeps up with our demand projections, there still may be unmet needs for care. A recent paper of ours compares demand-based health worker shortages (demand minus supply) to needs-based health worker shortages (need minus supply) and shows just how large the difference between the two measures can be (Scheffler *et al.*, 2018). The paper projects low-income countries to have essentially no demand-based health worker shortage in 2030, but a large needs-based shortage of 6 million health workers. The difference stems from the fact that low-income countries often lack the financial resources to generate substantial demand. Despite our focus on demand-based shortages in the paper currently under discussion, we believe both demand-based and needs-based shortage projections are extremely important for health workforce planning.

Later in the first paragraph, Professor Birch states ‘demand projections are fundamentally linked to, and certainly not independent of, supply’. This statement raises the notion of supplier-induced demand (Evans, 1974; Scheffler, 2008). In the context of our study, this means health workers can induce a shift in demand by patients. Professor Birch is correct, our model does assume independence between supply and demand. However, we believe that the importance of supplier-induced demand is not going to increase in the future. If anything, as more health systems move toward capitation and away from fee-for-service, it

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seems likely that the impact of supplier-induced demand will be reduced in the future.

Professor Birch also raises the issue that the introduction of medical technology and changes in productivity are not accounted for in our projections. Regarding the introduction of medical technology, the direction of the impact it would have on our projections is unclear to us. New treatments would increase demand, but an increase in preventive treatments would decrease future demand. Changes in health sector productivity have been notoriously hard to measure (Sheiner and Malinovskaya, 2016). Official data often show productivity growth in health care to be negative (Cutler, 2011; Triplett, 2013). Despite the fact that the difficulty in measuring increases in quality likely makes official estimates underestimate, it does appear that health sector productivity increases have been below the productivity increases of many other sectors (Cutler, 2011). Nevertheless, if health care productivity does increase rapidly in the next 15 years, health worker shortages will be less severe than we are projecting.

A final point we want to make is with respect to the last line of Professor Birch's comment. Professor Birch states, '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)'. We agree that this is a promising way forward. Fulton *et al.* (2011) reviewed recent evidence on health workforce skill mix and task shifting and found that there is substantial evidence that task shifting can alleviate workforce shortages and skill mix imbalances. For example, surgically trained assistant medical officers in Mozambique produced similar patient outcomes at a significantly lower cost as compared to physician obstetricians and gynecologists. However, the results from task shifting may not always be favorable. Zachariah *et al.* (2009), in a study of task shifting to treat HIV/AIDS in sub-Saharan Africa, found quality and safety concerns related to task shifting. Ultimately, the appropriateness of using task shifting to ameliorate health workforce shortages is task-specific. But for tasks where quality and safety concerns do not arise, task shifting could be a useful tool for addressing the projected shortages we report in our paper.

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