Enhancing the value of *Health Care Services* at a regional level

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Abstract

Health Care Services (HCS) industry is an important part of the vital, prosperous society. The presence of quality *HCS* is considered to be crucial for attracting new industries, retaining the existing ones and attributing to the overall social and economic prosperity of the region. However, it is not clear how to increase the value of *HCS* industry in regions. *HCS* industry might be one of the largest industries in the region in terms of creating employment and generating income; it does not necessarily create linkages with other industries in the region, and therefore it does not contribute fully to the prosperity of the regions. Using a case study of Fitzroy Statistical Division (a non metropolitan region in Queensland, Australia) the regional economic diversity is identified using the input output analysis. It is argued that each region needs to identify its key sectors in terms of backward and forward linkages in order to suggest which industries in the region need to be encouraged to increase their connections with *HCS* industry to increase the value of *HCS* in the region.

Key words: CQML, *Health Care Services* industry, regional development, key sectors, input output, Queensland

1 Introduction

Central Queensland Medicare Local (CQML) is a part of Health Care Services (*HCS*) industry in Queensland, Australia. It was established under a Commonwealth Government initiative, in 2012, to coordinate primary health care delivery and address local health care needs and health service gaps. The aim of this initiative was to improve the population's health outcomes and to reduce inequalities in the provision of health services. The CQML model is premised on devolution of decision making to the CQML region utilising the local skills and knowledge that are unique to each of the health catchment areas. The expectation is that each CQML would be in the best position to ascertain the needs of their health region and through integrating and coordinating primary *HCS* meet the local requirements best, with local solutions and ownership of the health system outcomes (DHA, 2012). The aim of the project was to provide an economic assessment of CQML health service in Fitzroy region, Queensland, Australia.

CQML falls mainly in Fitzroy SD region. Fitzroy SD is located in Central Queensland, about 600km from Brisbane (main city of Queensland) and has a variety of settlements ranging from large regional towns to small mining towns.

The *HCS* industry is important at the regional level; however, the assessment of the economic impact of the industry is usually limited to a simple assessment such as estimating output, direct employment and wages spent in the region. In some cases, a benchmark analysis or productivity analysis is performed (Akbar et al, 2013). The most comprehensive analysis is using a general equilibrium or input output (IO) models to assess the regional economic benefits from the investment in *HCS*. However, there is little understanding on how to use the estimated effects to further enhance the value of presence of *HCS* in the region in terms of further increasing employment and income within the region.

Furthermore, Senterfitt et al. (2013) showed that health outcomes such as mortality and morbidity depend on health factors which are influenced by programs and policies. Socio-economic factors, including employment and access to clinical care, contribute to 60% of health outcomes. It is indicative to use more comprehensive economic evaluation of the position of the *HCS* industry in the region with the potential to recommend which industries should be encouraged to form local relationships with *HCS* industry in order to increase employment and income in the region. Ivanova (2014) suggested recognising the importance of regional differences and using those differences to the advantages of the communities.

We suggest using a multilevel approach that will allow to not only assess the impacts of *HCS* in the regions but also to further increase the value of *HCS* industry to the region. The first step is to identify community needs for health services using Social and Health Impact Assessment tools. The second step is to identify the connections between the *HCS* industry (eg local hospital) and other industries within the region (eg agriculture, transport, and services). The aim is to identify the key connections, which if boosted, will allow the region to gain most in terms of employment, income and industrial output. Once the key connections are identified, local initiatives or policies need to be put in place in order to enhance those connections between the health sector and other industries in the region. The third step is to provide recommendations to increase the value of the health industry in the region.

This paper is focused on the second step and uses the IO analysis to identify the key sectors in Fitzroy SD which stimulate regional growth more than other sectors and have greater employment, income and other impacts on the regional economy than other sectors. The connections between the *HCS* industry and those key sectors are examined. The recommendations are made on how to increase the value of the *HCS* industry in Fitzroy SD based on linkages of the industry with the key industries in the region.

The identification of inter-industrial linkages and key sectors within the region can be useful in economic planning for generation of above average economic activity (Lenzen 2003). Since most analysis is typically focused on the national or state benefits from *HCS* industry, while fewer studies address its regional and local consequences (eg. Akbar et al (2013); Doeksen et al. (1997); Doeksen and Schott (2003) and Doeksen et al. (2009)), this paper emphasises the importance of more comprehensive economic analysis at the regional level using a case study in Queensland.

Akbar et al (2013) identified the economic benefits of CQML and equated the outcomes with increased productivity, estimated reduced hospital admissions, benefits of longer and more productive life span, increased good health reducing the reliance on the health sector as a whole, health jobs created or sustained in the region, the amount of primary health dollars attracted to the region through the CQML. We extended this research by further examining the role of *HCS* in regional economy.

The rest of the paper is structured as follows Section Two suggests a new method to assess the economic impact of the *HCS* industry. Section Three outlines the main results. Section Four concludes.

2 Methods

We suggest assessing the economic impact of CQML services by using a regional IO model which calculates the multiplier effects of direct *HCS* budget spending on operations and staff. The identification of key sectors of the economy involves calculation of the backward and forward linkages which measure the strength of the relationships of the intermediate sectors (Rasmussen, 1956). Any sector generates two types of economic effects on other sectors in the economy: the demand (backward linkages) and supply (forward linkages) driven effects (Miller and Blair, 2009).

The key sector in the economy is identified by comparing the magnitude of their normalised[1] backward and forward linkages. If the backward multiplier of one sector is larger than that of the another sector (i.e. *Building Construction* industry and *Finance and Insurance* industry), it can be suggested that one dollar of expansion of the former sector output would be more beneficial to the economy than would an equal expansion in the latter sector's output in terms of generating more productive activity throughout the economy. Similar logic applies for the forward multipliers (i.e. *Transport and Storage Services* industry and *Public Administration and Defence* industry). Hirschman (1958) suggested that investment in a key sector should enhance a country's economic development since the investment in the key sector will increase the expansion of other sectors, as an above-average user of inputs from other sectors and as an above-average supplier of inputs to other sectors. Following West (1982) a key

[1] The row and column averages of Leontief inverse are divided by the total average (Hazari, 1970).

sector in this paper is defined as one which exhibits both high backward and forward linkage indexes and low backward and forward spread indexes[2].

When the *HCS* industry increases its output, then it will demand more inputs from the sectors whose products are used as inputs to the *HCS* sector (e.g. *Accommodation and Food Services* industry). This effect is limited to what inputs are available in the region. This is called a demand driven effect (or backwards multipliers). When the *HCS* sector sells more of its services to other sectors, it creates a supply side effect (or forward multipliers). This effect is limited by the level of the population and its health status.

The new method for policy analysis is suggested as follows. First, the analysis of the *HCS* industry's contribution to the regional and state economy is performed. Second, the disaggregated multipliers[3] are calculated for the *HCS* industry. Third, the key industries in the region-- those stimulate the regional economy the most-- are identified. Fourth, the connections between the key industries in the region and *HCS* industry are examined. Fifth, policy measures to enhance these connections are suggested.

3 Results

The *HCS* industry is one of the largest employers in Australia, Queensland and Fitzroy Statistical Division (SD). It accounts for 7.2% of total persons employed in Australia, 7.5% in Queensland and 6.1% in Fitzroy SD. To measure the economic impacts of the *HCS* sector and identify key sectors of Fitzroy SD region the IO model was built based on the latest Australian national IO tables 2009-10. The IO analysis showed that in Australia, the *HCS* industry for each dollar of services produced paid 67 cents in compensation of employees, 7.5 cents in gross operating surplus and mixed income and used 3 cents worth of imports. The following industries were major suppliers to *HCS* in Australia (% of intermediate inputs): *Professional and Administrative Services* (19%), *Media and Telecommunication* (13%), *Rental and Hiring (10%), Wholesale trade* (7%), *Art, Sport, Recreation and other Services* (6%), *Financial and Insurance Services* (6%) and *Public Administration and Defence* (5%).

In Queensland, the top five industries for the open model for output based on total disaggregated *HCS* multipliers are: *Ownership of Dwellings, Professional and Admin Services, Retail Trade, Finance and Insurance and Wholesale Trade*.

Table 1 shows the key sectors based on the above average linkages and low spreads for Fitzroy SD based on output, income and employment. It should be mentioned that the key sectors are likely to be different in different regions (Ivanova, 2014). Table 1 shows that the following sectors have above average both backward and forward output linkages as well as low spreads: *Wood Products Manufacturing and Water Transport* industries. Several sectors

[2] The linkage above 1 (above average) indicates a strong effect of the sector on the rest of the economy. The coefficient of variation (spread) shows the spread of this effect in the economy. For example, the linkage with a value of 2 and coefficient of variation of 0.6 mean that the linkage is 2 times stronger than the average of all industries and that this value has a standard deviation of 60%.

[3] Disaggregated multipliers provide more information than total multipliers because they show multipliers by sector.

such as *Road Transport* and *Wholesale Trade* sectors are the key sectors in Fitzroy SDs in generating higher than average income in this region. The key sectors to increase employment are the *Road Transport*, *Wood Products Manufacturing, Postal Services and Transport* sectors.

In the case study, the key sectors with the higher than average backward and forward linkages include *Wholesale trade, Wood Products Manufacturing, Transport and Storage* industries among others. These are the same sectors that are in the top ten of the *HCS* industry multipliers.

Table 1. Key sectors, open model, Fitzroy SD.

Sector	Name	Backward		Forward		Average	
Output		linkage	spread	linkage	spread	linkages	spreads
10	Wood Products Manufacturing	1.08	0.68	1.43	0.60	1.25	0.64
26	Water Transport	1.05	0.85	1.46	0.84	1.26	0.85
Income							
10	Wood Products Manufacturing	1.14	0.75	1.73	0.58	1.43	0.67
21	Wholesale Trade	1.05	0.88	1.21	0.49	1.13	0.69
24	Road Transport	1.18	0.79	1.18	0.53	1.18	0.66
26	Water Transport	1.09	0.84	1.25	0.74	1.17	0.79
28	Postal services	1.01	0.68	2.61	0.75	1.81	0.71
29	Transport and Storage Services	1.15	0.92	1.87	0.88	1.51	0.90
Employment							
10	Wood Products Manufacturing	1.11	0.74	1.78	0.66	1.44	0.70
24	Road Transport	1.25	0.83	1.21	0.54	1.23	0.68
28	Postal Services	1.04	0.69	2.56	0.74	1.80	0.72
29	Transport and Storage Services	1.10	0.82	1.61	0.75	1.36	0.78

4 Conclusions

The *HCS* industry adds substantial benefits to the regional economy. While it is challenging to quantify benefits of the *HCS* industry in the region, a comprehensive analysis of the role of *HCS* industry in the region can help to develop strategies to enhance its value at regional level. For example, procurement by *HCS* at regional level that is targeted at key sectors connected with *HCS* industry can increase local employment, enhancing community wellbeing and social cohesion and stimulate the development of local business.

HCS industry (and CQML) at a regional level would need inputs from the same industries as it does at the national level. However, most of the inputs are imported to the region from the outside of the region suppliers. For example, Ivanova et al. (2007) showed that on average about 40% of business turnover 'leaks' outside the local economy. There can be a scope to source more inputs from local industries such as local administration, accommodation and other services, some food items to reduce the overall costs. On the other hand, the increasing supply from local firms could benefit the communities and the region.

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