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Productivity analysis of the private general dental sector in Australia, 1983 to 1998

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Abstract

The need for investigation of health economic issues continues to grow. Despite the tremendous gains potentially available to the dental sector, this area has until presently been a void within research in Australia. Economic analysis should become a stronger aspect of informing policy. At the core of economic analysis lies productivity, underpinned by the relationship between demand and supply. Currently there is a reported labour force shortage in the dental sector resulting from a trend of declining capacity to supply dental visits by the dental labour force (Spencer et al, 2003) coupled with increasing demand for dental visits of the dentate population (AIHW DSRU, 2003) observed over the last several decades.

The currently reported labour force shortage in the dental sector has led to the need to investigate productivity, which has been approached in this study by using econometric production function modelling. The study used data from the Longitudinal Study of Dentists' Practice Activity (LSPDA), collected by mailed questionnaire which provided four representative cross-sectional surveys conducted at five-yearly intervals spanning the period from 1983/84 to 1998/99. The cross-sectional and longitudinal components of the LSPDA provided a unique opportunity to specify econometric production functions for each survey year cross-sectionally and across time (1983-1998) using panel longitudinal data. Until presently, production functions had been specified predominantly as cross-sectional snapshots in time. The methodology implemented in this study enabled testing of which input factors, grouped into capital (utilisation of surgeries and x-ray units) and labour inputs (dentist chairside hours, intra- and extra-oral auxiliaries), dentist characteristics (sex, experience, university of graduation, country of birth) and practice characteristics (configuration, size, state location, perceived busyness, length of wait for an appointment) were significant in each survey year production function and across a range of productivity measures including; patients-, services-, relative value units (RVUs)- and gross billings ($GB) per day. A longitudinal panel production function was then specified for each productivity measure to investigate productivity time trends across the 1983 to1998 period.

The overall productivity time trend observed across the 1983 to 1998 period was a decline in patients (20.8%) and services (11.1%) per day, at a reasonably stable level of work effort (RVUs per day) increasing by only 3.3%, and very high monetary rewards in the form of greatly increased $GB per day (126%) for private general dentists.

Overall, the most consistent and significant input factors were related to labour inputs consisting of dentist chairside hours per day and number of extra-oral auxiliaries per dentist. Inputs that did not show a significant association with productivity included sex, the number of intra-oral auxiliaries per dentist and practice characteristics such as configuration and size. The non-significance of the practice characteristics may be attributable to the way in which the LSPDA questions were worded; possibly resulting in inconsistency in the interpretation from participants, while intra-oral auxiliaries do not feature strongly as they are few in number and are more complementary rather than substitutional in terms of dental provision as compared with the dentist.

The production functions synthesised were OLS regression models which exhibited reasonably good fit and explained the variation in productivity within the range of 36 to 42% for patients per day, 22 to 30% for services per day, 15 to 41% for RVUs per day and 18 to 31% for $GB per day. Overall, the production functions with the greatest number of significant explanatory input factors and best fit were those estimated with patients per day as the dependent variable, while the production functions estimated with $GB per day as the dependent variable achieved the least number of significant variables and least 'best fit'.

The productivity time trends and relationship between the different productivity measures could have serious implications within private dental practice in the face of an already under-supplied labour force which could lead to increasing fees, decreased access to dental care and longer waiting times for routine dental care. The consequences are further complicated by the fact that coupled with an under-resourced public dental system and maldistribution of private dentists this leaves the highest risk groups most vulnerable to unaffordable dental care, decreased access to care and compromised treatment options when care is sourced. Implications of this kind warrant public intervention.