# 2 Overview of supply and demand models

A useful basic plan for the relationship between supply of and demand for dental services and, subsequently, the dental labour force is a model adapted from that proposed by DeFriese & Barker (1982). The model, presented in Figure 1, begins at the periphery with head counts of the dental labour force and the population and endeavours to work towards common units to quantify both the capacity to supply dental services and the demand for dental services. The model illustrates:

- the complexity on the supply side introduced by multiple levels of qualification among personnel and the consequent mixing within individual dental practices or clinics of personnel to produce the services supplied

- the complexity on the demand side of reconciling the interaction between oral health status, needs and demand for dental services

- the interface between supply and demand, where decisions on the appropriateness of the balance reflect social, economic and political interests and drive policy directions.

Source: Adapted from DeFriese & Barker 1982.

Figure 1: Relationship between supply of and demand for dental services
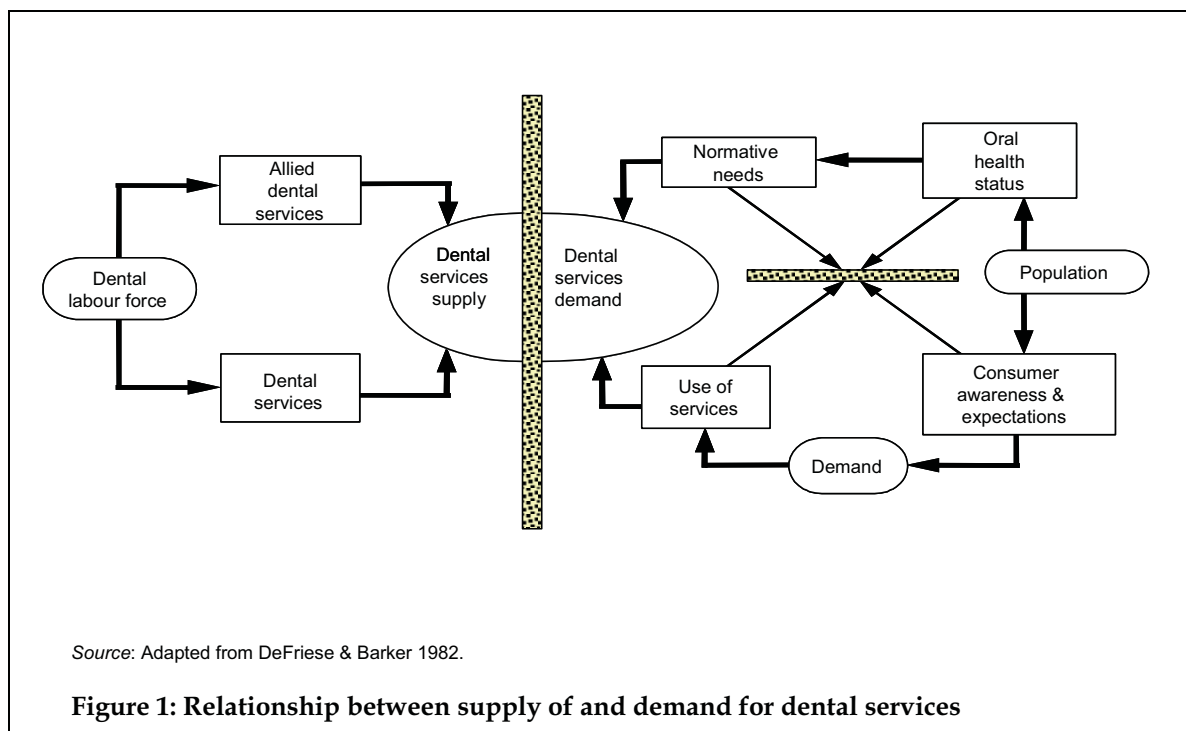
2.1 Supply model

Projections of the dental labour force are based on entering inflows and outflows from a stock of dental personnel into a modified Markov chain model (see Appendix B for detailed description). As seen in Figure 2, inflows to the stock of dentists comprise Australian university graduates, migrants to Australia, and those who return to practice after a length of absence. Movement out of the stock, or wastage, is associated with migration out of Australia, retirement, death and cessation of practice, either permanently to pursue another career or for an extended term, e.g. study or parental leave.

Figure 2: Schematic model of dental recruitment and wastage
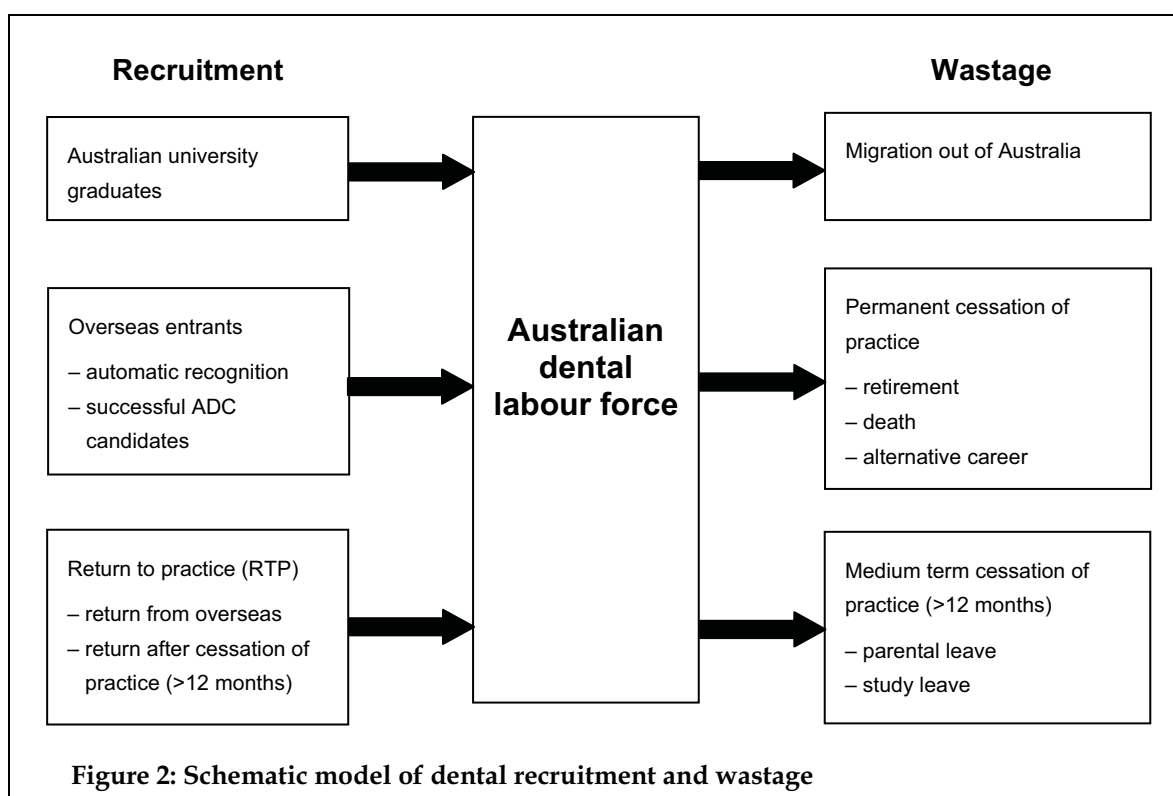
Projections of dental visits supplied are calculated by multiplying the projected numbers of practising dentists and allied practitioners by sex-and age-specific estimates of visits supplied per annum. The principal data sources are the National Dental Labour Force Data Collections (NLFDC) and the Longitudinal Survey of Dentists' Practice Activity (LSDPA).

2.2 Demand model

For the purposes of this publication the word 'demand' is used synonymously with usage of dental care—in other words, expressed demand. Historical patterns of usage are examined and used to estimate future demand for dental care. Projections of demand presented in this publication are an estimate of the quantity of dental visits that people are likely to consume based on previous consumption. This definition of demand does not directly relate to need for dental care and does not include the occurrence of people wanting or seeking care but unable to access care.

In simple terms the demand projection model multiplies the age specific PCD rates for dentate and edentulous persons by the numbers of people that are predicted to be in those groups in the future (Figure 3).

There are four key factors that influence and impact on demand for dental visits:

- **Increases in the population**
  As the total number of people in Australia increases, it follows—all other things being equal—that the total number of visits demanded will also increase.

- **Demographic changes in the population**
  Not all age groups demand the same amount of dental care. If the population age distribution shifts in such a way that a greater proportion of people are in age groups that demand greater dental care, total demand will increase.

- **Changes in the percentage of edentulous persons**
  Edentulous persons (those with no natural teeth remaining) demand dental care at a far lower rate than dentate persons (those who still have some natural teeth remaining) of the same age. Historically, the percentage of the population that is edentulous has been declining, resulting in greater percentages that are dentate. Thus, for a fixed population, a decline in edentulism equates to an increase in the dentate population and therefore results in an increase in total demand.

- **Changes in per capita demand**
  If per capita demand (PCD—the average number of dental visits per person) changes, then total demand for visits must also change. Historically, there is evidence that PCD for dental visits in Australia has been increasing over time.
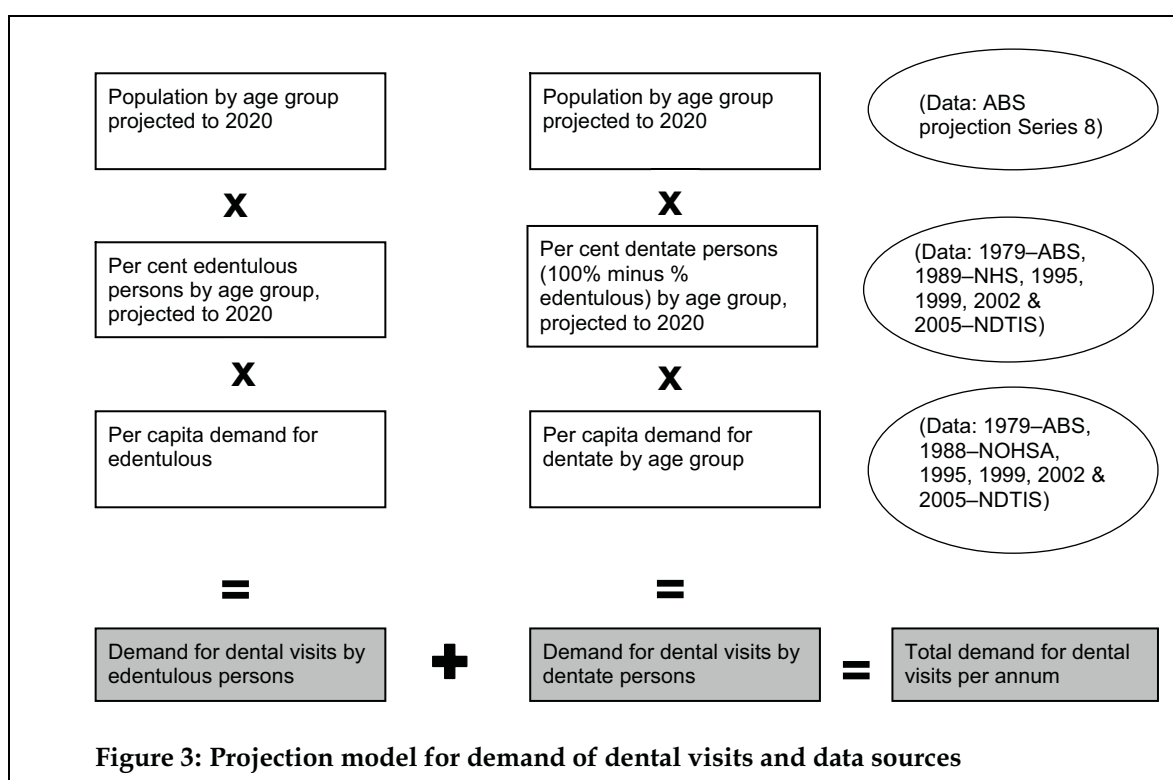

Figure 3: Projection model for demand of dental visits and data sources