

Dentist-to-Population Ratio in Nepal: Are We Reaching or Breaching the Goal?

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Oral health reflects an individual's overall health and quality of life. The "Global Burden of Disease Study-2017" estimated oral diseases in 3.5 billion people worldwide.¹ Oral diseases are treated by the dentists. The need, demand, and supply of dentists vary among the countries and more specifically the regions or locations within the country. The dentist-to-population (DtP) ratio or synonymously population-to-dentist ratio is the key indicator of the dental service data and workforce count in a country. This editorial discusses the DtP ratio scenario of Nepal.

The DtP ratio represents the population served by one dentist if the whole population of a country is distributed equally across all practicing dentists. For example, if there are 500 dentists in a country with a population of one million people, the DtP ratio is 1:2000. Thus, the DtP ratio for an area = N_p/N_d , where N_p is the total population and N_d represents the total number of dentists in the area. There are other mathematical equations that compute DtP ratio measuring the patients' visits per year or operator's Busyness Index.^{2,3} These mathematical calculations actually determine the surplus or shortage of dentists in a given area. They require the data on patients' visits or clinical audit, which are devoid in Nepal's state health system. Thus, many countries including Nepal project the DtP ratio based on the simple formula of N_p/N_d .

The evaluation of DtP ratio has few shortcomings: i) The 'ideal' ratio is indeterminate, thus the use of a normative value is questionable; ii) The ratio makes the assumption that all dental practitioners are equally productive; and iii) The ratio also assumes that the dental demands of the populations are equal.^{2,3}

The DtP ratio varies largely among the regions. According to World Health Organization, the ratio is approximately 1:15000 in South-East Asia, 1:7800 in Western Pacific, 1:5500 in Eastern Mediterranean, 1:42000 in Africa, 1:2000 in Europe, and 1:1400 in the Americas. The global DtP ratio is 1:4400.⁴ The periodic ratios of Nepal is presented in Table 1.

The DtP ratio in Nepal has dropped down exponentially in recent decade. Based on the total number of registered dentists⁵ and census report-2021,⁶ the present ratio is 1:7221. This ratio has surpassed WHO's recommended goal of 1:7500 arithmetically. However, the effective DtP ratio in Nepal would be 1:10315 as only about 70% of the total dentists are professionally active in the country.

Studies report substantial disparities in the geographic distribution of dentists in Nepal. Dentists are distributed relative to higher population clusters and are unevenly distributed.^{7,8} The ratio is gradually decreasing in capital

Table 1: Dentist-to-population ratio in Nepal.

Year	Number of dentists	Population (in million)	Annual population growth rate (%)	Dentist-to-population ratio
1970	11	12.07	2.00	1 : 1,100,000
1980	24	15.02	2.30	1 : 630,000
1990	40	18.91	2.50	1 : 470,000
2000	202	23.94	1.80	1 : 120,000
2010	1118	27.01	0.50	1 : 24,000
2015	1809	27.02	0.40	1 : 15,000
2020	3663	29.14	1.80	1 : 8,000
2025*	5881	30.79	1.70	1 : 5,235
2030*	8180	33.39	1.01	1 : 4,081

*Projected

and major cities; which however remains very high in rural areas. Out of the total registered dentists, about 57% work in Kathmandu valley.⁸ Thus the present DtP ratio of Kathmandu valley is as low as 1:1720 compared to out of the valley, which is 1:14245. The proportion of dentists working in rural areas would still be less. The disparity situation between urban and rural areas is similar worldwide,⁹ especially in South Asian nations India, Bangladesh, and Pakistan.¹⁰⁻¹²

The recommended DtP ratio according to WHO is 1:7500. Until a decade ago, it was a big dream and a target of many countries to achieve the recommended goal. Presently, the target has been met by many developing nations including Nepal. This accomplishment is due to the production of dentists from numerous dental colleges established in recent decades. It has been realised that merely reaching the recommended DtP ratio does not largely fulfil the human resource and service need of the country. This gap is mainly because of the uneven distribution of the population, concentration of the dentists in urban region, over production of dental workforce, and lesser number of posts for dentists in public sector. The dental service is largely provided by the private sector, which has led the service in urban concentration with profit-making purpose. The diminished governmental priority and lowered provision of dental health care in the universal health coverage and health insurance schemes further fail to avail the public dental health services. This in turn, increase the out-of-pocket expenditure.

The following case study is deemed useful in planning dental health workforce in the country. In Taiwan, the DtP ratio defined as the number of dentists per 10,000 people

was 5.0 in 2010. The country maintained the constant supply of 400 dentists per year from 2006 to 2010, and was expected to sustain for next 10 years; because the population growth rate of Taiwan began to decrease. It was estimated that the DtP ratio of the country would increase to 6.0 by the year 2000. After adjusting for working hours, working days, and gender differences; the surplus number of dentists was approximately 1069 in 2020, which was achieved as planned.¹³

Thus, it is time to introspect the Dentist-to-Population ratio in Nepal; if are we reaching or breaching the recommended goal. The oversupply of dentists will result in the unemployment problem and deflation of the professional service. The current scenario indicates that there is a lack of systematic planning in the development and establishment of dental colleges and the allocation of dental manpower. A strategic plan for the dental workforce is of utmost importance from the departments of health and education. The process requires prevailing data of dental workforce and workloads. A consensus workshop with the involvement of stakeholders can determine the periodic requirement of dental workforce in the country keeping into considerations of population growth, economic growth, population migration, demand for health workforce, dental health infrastructure and resources, budgetary allocations, dentist-auxiliary ratio etc. It will maintain the net increase of dentists per year as per the requirement of the country. As a philosophy of welfare state; the surplus dentists shall be recruited for the healthcare of the aged, disabled, underserved, and rural population under special programs or schemes.



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