ORAL HEALTH REPORT

2018

Ministry of Health and Indigenous Medical Services
Sri Lanka

Annual Oral Health Report

2018

Research and Surveillance Unit
Institute of Oral Health
Ministry of Health and Indigenous Medical Services
Sri Lanka

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Message from the Director General of Health Services

It is my utmost pleasure to forward this message to the "Annual Oral Health Report-2018" of Sri Lanka. With the vision of building a healthier nation, Ministry of Health identifies the importance of providing oral health services in order to reduce the oral disease burden in our country. Annual Oral Health Report-2018 describes the services provided to the Sri Lankan public by the government oral healthcare team during the year 2018.

Periodic evaluation of the services provided to the public is important to identify the strengths and weaknesses within the system. Therefore, this information can be utilized in future for development of oral health policies, successful planning and implementing of oral health programmes and equitable distribution of resources.

This effort of initiation to publish an annual oral health report would be appreciated and I would suppose this process will continue annually, which is useful for improvement of the quality of oral health services provided to the Sri Lankan public.

Dr. Anil Jasinghe
Director General of Health Services
Ministry of Health and Indigenous Medical Services

Message from the Deputy Director General of Dental Services

Despite being preventable, oral disease is widely spread causing considerable amount of burden for the Sri Lankan public. It is essential to plan and reorganize the oral health services provided to the public regularly, in evidence-based manner to provide better quality care, which will reduce the oral disease burden.

Annual oral health report 2018 explains the performance of the government dental surgeons and school dental therapists who are the main oral healthcare providers in Sri Lanka. These results will make the baseline information of the oral healthcare system which can be utilized to improve the oral health services provided to the public in future.

I appreciate the dedicated service rendered by Dr. Prasanna Jayasekara Consultant in Community Dentistry and the team. It is my sincere expectation that all relevant parties will take maximum use of this report to plan and to provide quality oral healthcare for our nation.

Dr. Ananda Jayalal
Deputy Director General (Dental Services)
Ministry of Health and Indigenous Medical Services

Preface

Research and Surveillance unit of Institute of Oral Health, Maharagama, is pleased to present the first annual oral health report. This report provides the status of the oral health services and its progress.

This report consists of routine data reported through monthly returns of dental surgeons (H1201a), school dental therapists (H982) and secondary data from other published health reports.

Information provided in this report would be utilized for programme planning at national, provincial and regional levels and to identify the areas which need special attention in order to provide quality oral health services to Sri Lankan public.

I would like to extend the sincere gratitude to the relevant authorities of Ministry of Health and Indigenous Medical Services for identifying the oral health programme as a key element in the health system and providing continuous leadership and support to improve the oral health services. All the experts who gave the valuable technical inputs should be appreciated. The administrative support and the guidance given by the Deputy Director, Institute of Oral Health, Maharagama should be highly appreciated. Without the enormous support given by the regional dental surgeons, dental surgeons and school dental therapists this effort would not be a success. Special thanks go to the members of the Research and Surveillance Unit, Institute of Oral Health, Maharagama for their valuable contribution.

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Executive summary

Research and surveillance unit, Institute of oral health, Maharagama has been collecting the data related to the monthly work performance of all government dental surgeons for many years via the monthly return H 1201a. This report explains the analysis of these data which can be used at different levels to plan oral healthcare services all over the country.

This report provides a descriptive picture of the oral disease burden, coverage and treatments provided by the government dental surgeons and school dental therapists. The results were analyzed and presented at the institutional level which will be more important to plan, monitor and evaluate the oral health services for future.

This report introduces a new information flow system to collect the data accurately and timely which will help to monitor and evaluate the oral healthcare services annually and that will lead to improvement of the quality of services provided to the public and ultimately reducing the oral disease burden.

Key Findings-

Number of consultants (End of 2018)	108
Number of dental surgeons (End of 2018)	1596
Number of school dental therapists (End of 2018)	339
Population per Dental surgeon in 2018	13,661
Total number of patients treated in 2018	3,744,466
Monthly average number of patients treated by a dental surgeon in 2018	306
Monthly average number of OPMD cases identified in a clinic in 2018	9
Monthly average number of Pregnant mothers treated in a clinic in 2018	32
Monthly average number of Under 3 children treated in a clinic in 2018	5
Monthly average number of Adolescents treated in a clinic in 2018	53
Average target population per SDT in the year 2018	3326
Monthly average number of school children screened by a SDT in 2018	213
Monthly average number of school children treated by a SDT in 2018	131

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Abbreviations

OPD	-	Out Patient Department
OPMD	-	Oral Potentially Malignant Disorders
TMJ	-	Temporomandibular Joint
SDC	-	School Dental Clinic
SDT	-	School Dental Therapist
ADC	-	Adolescent Dental Clinic
CDC	-	Community Dental Clinic
FDS	-	Faculty of Dental Sciences
DTTS	-	Dental Therapists Training School
RDS	-	Regional Dental Surgeon
NOHS	-	National Oral Health Survey
DMFT	-	Decayed, Missing, Filled Teeth -Permanent
dmft	-	Decayed, Missing, Filled Teeth -Deciduous
DC	-	Dental Clinic
NIHS	-	National Institute of Health Sciences
GIC	-	Glass Ionomer Cement
MOH	-	Medical Officer of Health
RCT	-	Root Canal Treatment
MSc	-	Master in Science
MD	-	Doctor of Medicine
IEC	-	Information Education and Communication

Summary Statistics

Indicator		Data	Source
Demographic Indicators			
Total population (2018 Mid-year Population estimates)		**21,670,000**	Department of Census and Statistics
Land area of Sri Lanka (km^2)		**65,610**	Survey Department
Population density - 2018		**346**	Department of Census and Statistics
Crude birth rate – 2018 (per 1000 persons)		**15.1**	Registrar General's Department
Crude death rate – 2018 (per 1000 persons)		**6.4**	Registrar General's Department
Sex ratio - 2018 (Number of males per 100 females)		**93.9**	Registrar General's Department
Under five years population - 2018 (percentage)		**8.6**	Registrar General's Department
Urban population – 2017 (percentage)		**18.5**	Sri Lanka Demographics Profile 2018
Socio-economic Indicators			
Unemployment rate - 2018		**4.4**	Central Bank of Sri Lanka
Dependency ratio	Total	**37.59**	Registrar General's Department
	Elderly (60 years or more)	**12.35**	
	Youth (under 15 years)	**25.24**	
Literacy rate (age 15 years and above)		**92.6**	Sri Lanka Demographics Profile 2018
Gross national income per capita -2018 (Rs)		**648,730**	Central Bank of Sri Lanka
Per capita GDP (US$)- 2017		**4,065**	Central Bank of Sri Lanka

Health Indicators		
Life expectancy at birth m/f - 2017	**73/79**	World Bank Report
Probability of dying under five per 1000 live births – 2018	**7.4**	World Data Atlas
Maternal mortality rate (per 100,000 live births)	**39.0**	Family Health Bureau
Health Resource		
Total health expenditure (Rs. Millions) - 2018	**218,462**	Central Bank of Sri Lanka
Total Health Expenditure as a % of GDP - 2018	**1.51**	Central Bank of Sri Lanka
Population per medical officer - 2017	**1083**	Medical Statistics Unit
Population per dental surgeon - 2018	**13,661**	
Dental surgeons per 100,000 population	**7.9**	
Number of hospitals with dental clinics - 2018	**735**	
Number of consultant dental surgeons including those in three forces - 2019	**108**	
Number of consultant dental surgeons in the administrative grade - 2019	**5**	
Number of consultant oral and maxillofacial surgeons including those in three forces and Dental Faculty-Peradeniya - 2019	**39**	
Number of consultant orthodontists including those in three forces and Dental Faculty-Peradeniya - 2019	**25**	
Number of consultants in restorative dentistry including those in three forces and Dental Faculty-Peradeniya – 2019	**16**	
Number of consultants in community dentistry including those in three forces - 2019	**11**	
Number of consultants in oral pathology including those in the Dental Faculty-Peradeniya	**5**	
Number of dental surgeons including consultant dental surgeons and those in three forces - 2019	**1704**	
Number of dental therapists - 2019	**369**	

Number of dental technicians – 2019 (Government /University)	**42**	
Oral Health Indicators		
Percentage of 12 year olds with dental caries	**30.4**	National Oral Health Survey Sri Lanka 2015-2016
Mean DMFT – 12 year olds	**0.6**	
Percentage of 12 year olds with calculus	**47.0**	
Percentage of 35-44 year olds with periodontal pockets ≥4mm	**25.3**	
Percentage of 12 year olds brush teeth 2/day	**50.1**	

VISION

A healthier Sri Lankan nation with healthy mouths contributing to its economic, social, mental and spiritual development

MISSION

Contribute to social and economic development of Sri Lanka by performing all possible activities for achieving the highest attainable oral health status through promotive, preventive, curative dental services of high quality made available and accessible to people of Sri Lanka.

Chapter 1

Introduction

1.1 History and organization of the oral healthcare delivery system

Dental surgery as a profession in Sri Lanka was started in 1915 with United Kingdom qualified dental surgeons with in the private sector. With the improvement of dental education and the rising need for dental services, in 1925 a government dental clinic was started in the general hospital of Colombo followed by 1937 in Galle, 1938 in Kandy and later in Jaffna and other districts. In the Ministry of Health and Indigenous Medical Services, dental care provision was under the purview of chief dental officer and the designation was elevated from Assistant Director to Director and up to the level of Deputy Director General (DDG) post.

The dental treatments have improved from block cast iron chair with ratchet back and foot engine to even laser treatments. At the end of 2015 there were 700 government clinics, 1400 dental surgeons and around 60 consultants. These numbers have increased at the end of 2018 as 735 government clinics, 1596 dental surgeons, and 108 consultants to provide quality dental care to the Sri Lankan public.

In Sri Lanka oral health services are mainly delivered to the public by the government sector which is around 60% to 65%. Other oral health service providing stake holders are private sector (30%- 35%), universities, tri forces, police & non-governmental organizations (2%-5%).

Oral healthcare services in the government sector consist of curative oral healthcare services and preventive and control oral healthcare services. These services are provided by a team of oral health professionals consisted of consultants, dental surgeons, nursing officers in dental clinics, school dental therapists, dental surgery assistants and dental technicians.

Curative oral healthcare services varying from the non-specialized outpatient department (OPD) oral health services to specialized oral health services, which are provided through

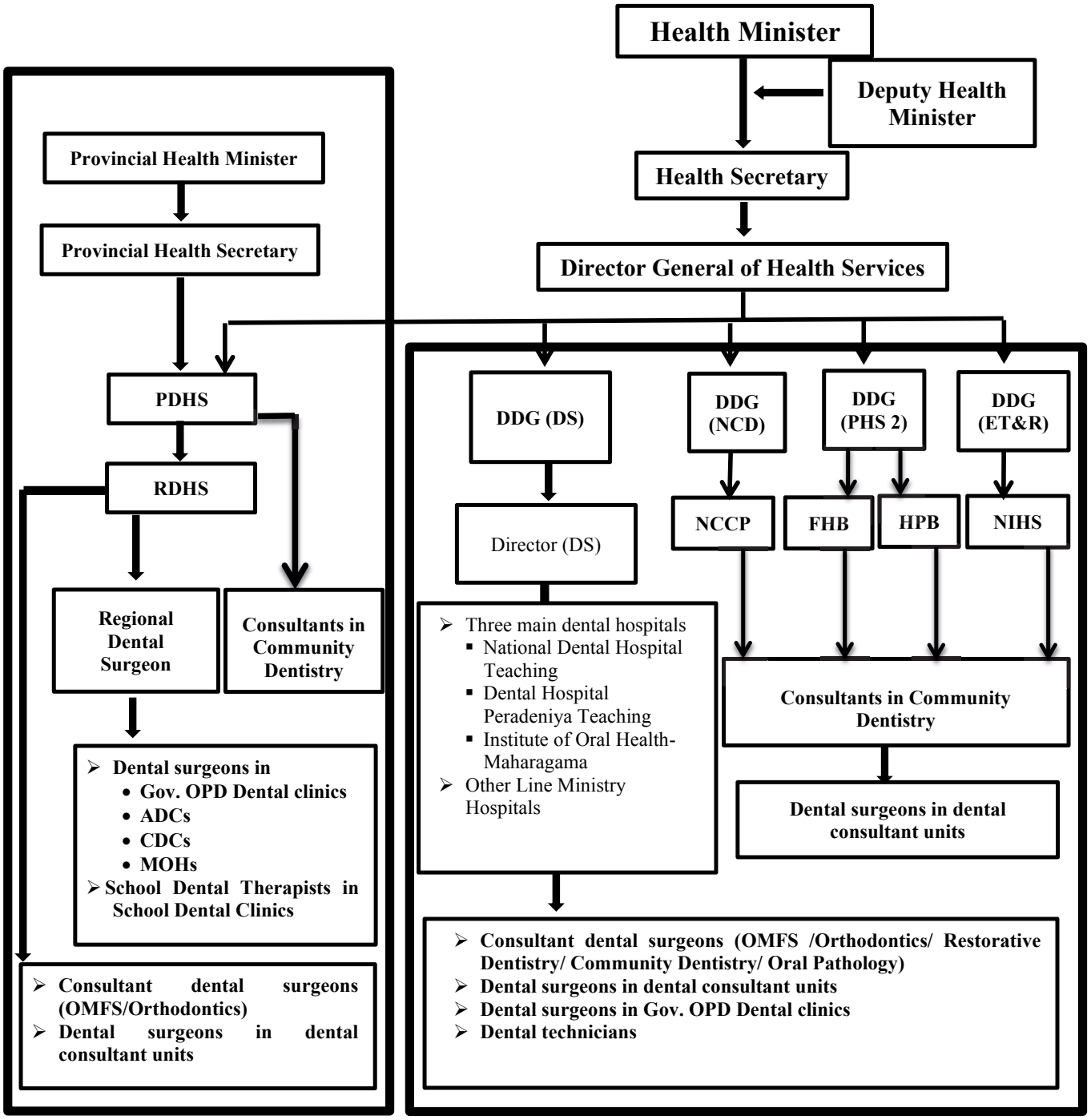
specialists as consultants in oral and maxillo facial Surgery (OMFS), consultants in restorative dentistry, consultants in orthodontics, and consultants in oral pathology.

preventive and control oral healthcare services are provided through national programmes and hospital dental clinics which lead by consultants in community dentistry (CCD) and the team consists of regional dental surgeons (RDS), dental surgeons (DS), supervising school dental therapists (SSDT) and school dental therapists (SDT).

In addition, there are dental surgeons who are specialized in medical administration and serve the country as health administrators.

The overall management of the oral health services of the country comes under the purview of the Deputy Director General (Dental Services) who is assisted by a Director (Dental Services).

Fig. 1.1 - Organogram of the oral health profile



DDG- Deputy Director General, DS-Dental Services NCD-Non Communicable Disease, PHS- Public Health Services, ET&R-Education Training and Research, NCCP-National Cancer Control Programmed, FHB-Family Health Bureau, HPB-Health Promotion Bureau, NIHS-National Institute of Health Science, PDHS-Provincial Director of Health services, RDHS-Regional Director of Health Service, ADC-Adolescent Dental Clinic, CDC-Community Dental Clinic, MOH- Medical Officer of Health, OMFS-Oro Maxillo Facial Surgery, Gov.-Government

1.2 Oral healthcare services provided in Sri Lanka

The services include following categories:

1. Curative oral healthcare services
2. Preventive and control oral healthcare services

1.2.1 Curative oral healthcare services

This consists of both general oral healthcare and specialized oral healthcare which are provided through the clinics located in peripheral units, divisional hospitals, base hospitals, district general hospitals, provincial general hospital and teaching hospitals. Specialized oral healthcare is provided through specialized units in hospitals as restorative dentistry, OMFS, oral pathology and orthodontics.

A. General oral healthcare (Out Patient Department Care)

General dentistry means the clinical aspect of dentistry which renders basic oral healthcare services to the general public which may extend from the basic to moderate treatment modalities depending on the institutional hierarchy in the health department.

Services available at Out Patient Department (OPD) dental clinic are as follows:

1. Emergency treatment: Management of severe tooth ache, dental abscesses, post-operative bleeding, swelling, other complications of dental origin and dental/ maxillofacial trauma which need emergency management.
2. Basic treatment on demand: Dental extractions, simple restorations, scalings ect.
3. Advanced restorations and minor oral surgical procedures: carried out in those clinics where the facilities are available.
4. Regular checkups and follow ups: Patients who need extra care for dental diseases and those who have medical problems that may affect the dental/oral health are called upon for periodical checkups and follow ups.

5. Screening for dental diseases and oral lesions: Early detection of dental caries, periodontal diseases and oral potentially malignant disorders.
6. Referral centers: The dental clinic being the focal point for advanced treatment modalities acts as a main referral center for appropriate specialized units such as OMFS, orthodontic, restorative and preventive units.

B. Specialized oral healthcare

1. Restorative dentistry

Restorative dentistry is the study, diagnosis and integrated effective management of diseases of oral cavity, teeth and supporting structures. This includes the rehabilitation of teeth and oral cavity to functional, psychological and aesthetic requirements of patient. It may require the coordination of multi-professional working to achieve these objectives. The discipline encompasses all aspects of operative dentistry, endodontics, fixed and removable prosthodontics (including maxillofacial prosthodontics), periodontics, peadodontics and implant dentistry.

- Operative dentistry involves the restoration of teeth damaged by caries, tooth wear and trauma
- Periodontology is the prevention, diagnosis and management of disorders of the tissues supporting the teeth and their associated structures;
- Endodontics is the diagnosis and management of disorders of the tooth pulp and the tissues surrounding the root of a tooth
- Prosthodontics is the management of teeth and associated structures lost as a result of disease, inheritance or trauma and replacement by removable and fixed prostheses including implants.
- Paedodonctics includes the diagnosis and management of dental problems in children under local or general anesthesia and management of traumatized deciduous and permanent teeth**.**

Main diseases and conditions which are treated in government specialized restorative units;

a. Dental trauma in children and adults
b. Complex endodontic procedures- non surgical and surgical
c. Removable prosthodontics which include removable partial dentures and obturators for congenital and surgical defects
d. Advanced restorative treatment of children under local and general anesthesia
e. Non-surgical and surgical periodontal treatment
f. Restorative care of patients with a variety of conditions in which dental treatment can be hazardous or complex such as patients with bleeding disorders, leukemia, endocardial lesions, some form of drug therapy, the elderly patients with special problems.
g. Multidisciplinary care for patients with congenital facial clefts or major dental abnormalities jointly with orthodontists, OMF surgeons, pediatricians and other medical specialties
h. Management of patients with developmental anomalies
i. Management of discoloured teeth
j. Management of worn dentition

2. Oral and maxillofacial surgery

Oral and maxillofacial surgeons manage a wide variety of problems related to soft and hard tissues of oral and maxillofacial (OMF) region. The scope of the specialty is large and not only deals with surgical problems but also non-surgical problems affecting the oro-facial region such as management of facial pain, oral mucosal diseases and infections.

Main diseases and conditions which are treated in the government specialized OMFS units

a. Minor oral surgery - Dentoalveolar surgery such as surgery to remove impacted teeth, difficult tooth extractions, extractions on medically compromised patients, root canal surgeries, pre prosthetic surgery to provide better anatomy for the placement of dentures or any other dental prostheses
b. Extractions and treatment under anesthesia for uncooperative and special children.
c. Diagnosis and treatment of non-cancer lesions such as cysts, tumors etc.

d. Diagnosis and treatment of oral & head and neck cancers (ablative and reconstructive surgery)
e. Diagnosis and treatment of cutaneous malignancy in face
f. Management of oral pre malignant disorders
g. Diagnosis and treatment of congenital craniofacial malformations such as cleft lip and palate
h. Diagnosis and treatment of salivary gland problems
i. Diagnosis and treatment of chronic facial pain disorders
j. Diagnosis and treatment of temporomandibular joint (TMJ) disorders
k. Diagnosis and treatment of jaw deformities. Orthognathic surgery is performed for surgical correction of jaw deformities and facial asymmetry.
l. Diagnosis and treatment of soft and hard tissue trauma of the oral and maxillofacial region (jaw fractures, cheek bone fractures, LeFort fracture and eye socket fractures).
m. Surgical treatment of sleep apnea (maxilla mandibular advancement)
n. Cosmetic surgery of the head and neck, browlift, blepharoplasty/cheek augmentation, chin augmentation, injectable cosmetic treatments as Botox, chemical peel etc.

3. Oral pathology

Oral and maxillofacial pathology is an expanding specialized field of diagnostic histopathology. It deals with diseases in oral cavity, salivary glands, paranasal sinuses, structures of the neck, maxillofacial soft tissues and skeleton. Oral pathologists are dental surgeons who have undertaken four years of local postgraduate training in diagnostic histopathology followed by one year overseas training. Diagnostic oral pathology encompasses microscopic examination of incisional biopsy specimens as well as examination of resection specimens from head and neck cancer and other lesions. A wide range of diagnostic techniques are used in an advanced oral pathology laboratory to arrive at a final diagnosis which enable clinicians to treat their patients promptly.

National Dental Hospital Teaching Sri Lanka (NDHTSL) has become the first government hospital to have oral pathology services catering four oral and maxillofacial units as well as other specialties in dentistry. A fully fledged new laboratory is coming up with the second

phase of the NDHTSL. Until such time, a laboratory with modern equipment has been established in a temporary space at the ground floor. Currently, routine histopathology reporting including specimen dissection and intraoperative consultations with the use of frozen sections are carried out by two consultant oral pathologists. Steps have been taken to start immunohistochemical studies and immunofluorescence studies in the near future.

The oral pathology laboratory at the NDHTSL functions as reference laboratory, the concept recognized and encouraged by College of Pathologist of Sri Lanka. Pathological specimens are received from nearby and distant OMF units.

Oral pathology reporting service is also available at teaching hospital Karapitiya with the availability of consultant oral pathologist. A separate laboratory for routine histopathological procedures has been planned in the new building coming up comprising all dental specialties at the hospital. Once that is established, the unit can be function as a regional reference laboratory.

Sixth trainee in oral pathology has completed local training and waiting for oversea training. Until such time, she is covering up duties of consultant oral pathologist at teaching hospital Kurunegala.

With time to come, there would be one oral pathologist at each province to cater oral and maxillofacial surgeons and other specialties in dentistry.

4. Orthodontics

Orthodontics is the dental specialty concerned with the growth of face, jaws and teeth and the practice of preventing and correcting irregularities of them.

Correction of malocclusions uses a range of treatment modalities using removable appliances plates, fixed appliances or orthopaedic appliances. (Orthodontic plates / Braces /Face mask / Head gear etc) In addition, patients with severe malocclusions, dentofacial deformities and craniofacial deformities are managed utilizing complex multidisciplinary approach combined with orthognathic surgery.

1.2.2 Preventive and control oral healthcare services

Dental Public Health/Public Health Dentistry/Community Dentistry is a specialized discipline in dentistry defined as the science and art of promoting oral health, preventing and controlling oral diseases aimed at enhancing quality of life of people by concerted, organized effort.

Dental public healthcare provision predominantly targets populations/population groups to cater to their oral health needs compared to individual persons who obtain dental care services on demand. As almost all oral diseases such as dental caries, periodontal disease and oral cancer which are considered as public health problems in Sri Lanka are preventable and controllable by evidence-based cost-effective strategies.

Preventive and control oral healthcare services are provided through national level programs, preventive oral health units and regional level through School Dental Clinics (SDC), Adolescent Dental Clinics (ADC) and Community Dental Clinics (CDC).

1.3 Training for oral health workforce

Oral health work force consists of consultants, dental surgeons, school dental therapists, dental surgery assistants and dental laboratory technicians and dental technicians who maintain the dental chair and other equipment.

The Faculty of Dental Sciences (FDS) at University of Peradeniya is the only institute in Sri Lanka which offers five year undergraduate degree programme in dentistry leading to Bachelor of Dental Surgery.

Postgraduate degrees leading to board certification as specialists in various disciplines of dentistry are carried out in collaboration with the Post Graduate Institute of Medicine, University of Colombo.

The Dental Auxiliary Training School which is affiliated to the Faculty of Dental Sciences, University of Peradeniya offers diploma programs in dental technology and dental surgery assistants.

The Dental Therapists' Training School (DTTS), Institute of Oral Health, Maharagama is the only one of its kind in Sri Lanka to train SDTs. This service was established under the Colombo plan. At DTTS, students follow a two year course leading to higher diploma in dental therapy mainly focusing on prevention of oral diseases by health education and oral health promotion. During the first year, the students obtain the knowledge in basic sciences and the second year is dedicated to clinical work on children. Prior to treating live patients, students are trained to work on dummy jaws. Rather than treating a particular tooth or symptoms, students are trained to treat the child as a whole encompassing emotional and spiritual as well as physical aspects of the individual.

1.4 Human resources in oral health services

Table 1.1- Distribution of the human resource in oral health service in the government sector in Sri Lanka (End 2018)

District	Consultants				SR			Diploma	RDS	SHO /HO	DS			Interns	SDT	Lab techs
	C	NC	F	U	C	NC	F				C	NC	F			
Colombo	21	11			29			11	1	97	128			34	46	22
Gampaha	4				1			3	1	26	76			3	34	1
Kalutara	3				0			2	1	16	51			2	18	1
Kalutara NIHS	0	1			0			0	1	0	7			0	3	0
Puttalam	2				0			1	1	10	39			1	15	0
Kurunegala	4				1			2	1	18	74			2	34	2
Rathnapura	4				0			2	1	13	61			2	18	1
Kegalle	2				0			1	1	8	38			1	14	1
Badulla	3				0			0	1	14	50			0	17	1
Monaragala	0				0			0	1	0	27			0	10	0
Galle	4				6			1	1	18	47			1	23	2
Matara	2				0			1	1	7	29			1	20	1
Hambantota	1				0			0	1	6	25			0	14	0
Jaffna	2				0			0	1	9	39			0	7	1
Killinochchi	0				0			0	1	0	9			0	2	0
Vavunia	1				0			0	1	5	12			0	4	0
Mullaitivu	0				0			0	1	0	8			0	2	0
Mannar	0				0			0	1	0	10			0	2	0
Trincomalee	1				0			0	1	3	25			0	3	0
Batticaloa	1				0			0	1	1	23			0	7	0
Kalmunai	0				0			0	1	0	29			0	8	3
Ampara	1				0			0	1	4	16			0	2	0
Anuradhapura	3				0			0	1	15	35			0	15	2
Pollonnaruwa	3				0			0	1	10	22			0	9	0
Kandy	6			18	23			5	1	49	85			5	23	4
Mathale	2				0			1	1	6	28			1	8	0
Nuwara Eliya	1				0			0	1	4	28			0	11	0
TOTAL	71	12	7	18	60	23	3	30	27	339	1021	27	66	103	369	42
	108				1596									103	369	42

**C-Clinical, NC-Non Clinical, F-Forces, U – University, SR-Senior Registrar, RDS-Regional Dental Surgeon, SHO-Senior House Officer, HO-House Officer, DS-Dental Surgeon, SDT-School Dental Therapists*

Table 1.2- Distribution of consultants according to the specialty including Ministry of Health and Indigenous Medical Services, Ministry of Defence and University (end of 2018)

Specialty	Number of consultants
Oral Maxillo Facial Surgery	39
Restorative Dentistry	16
Orthodontics	25
Dental Public Health	11
Oral Pathology	5
Other (Faculty of Dental Sciences – Peradeniya)	7
Administrators	5
Total	108

There were 83 dental consultants (both clinical and non-clinical) under the Ministry of Health, 7 dental consultants under Ministry of Defence and 18 dental consultants in the Faculty of Dental Sciences, University of Peradeniya at the end of 2018. There were 1596 dental surgeons working in the government sector at the end of 2018. Although there were 422 SDC in Sri Lanka, there were only 369 SDT in place at the end of 2018. There were 42 dental laboratory technicians working in the government sector.

Chapter 2

Purpose of the report, Data sources and Target population

- ## Purpose of the report

Annual Oral Health Report 2018 is published by the Ministry of Health and Indigenous Medical Services, Sri Lanka for the first time to provide information which illustrates the public sector oral healthcare service of the country. The main purpose of this report is to give a feedback to main stake holders in oral health programme regarding their successes and way to further improvement of their hard work on oral health programme. This report includes history of dentistry, current available oral health services, achievements in oral health and the performance of dental surgeons and school dental therapists in the recent past. The district level and national level data published in this report can be utilized by the programme planners and administrative officers for future planning processes.

- ## Data sources

Data and information collected through monthly returns of DSs, and SDTs were summarized and analyzed. Secondary data from National Oral Health Survey (NOHS), Annual Health Bulletin (AHB) were also utilizes for trend analysis.

Fig. 2.1: Information flow of the existing oral health surveillance system

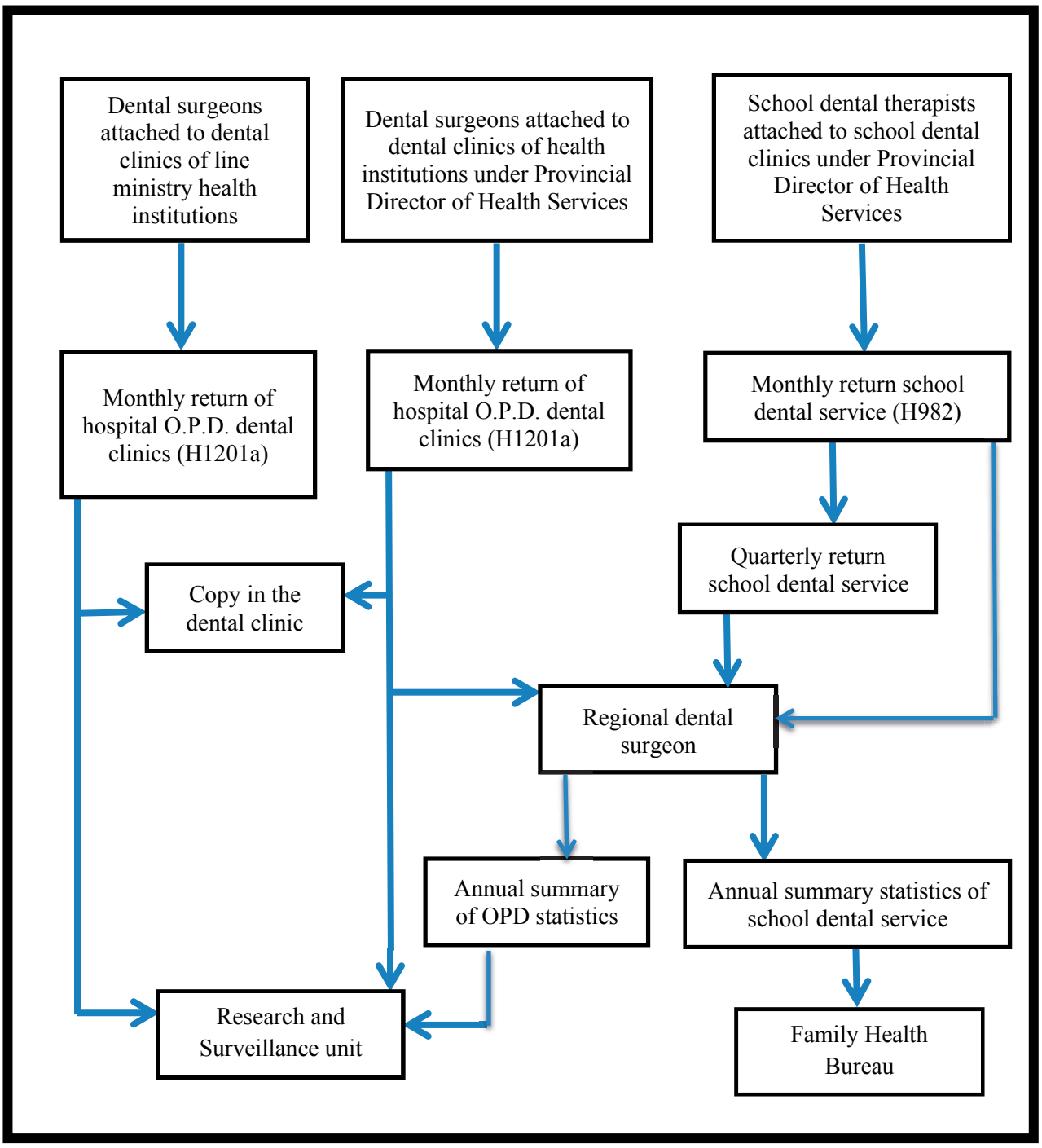
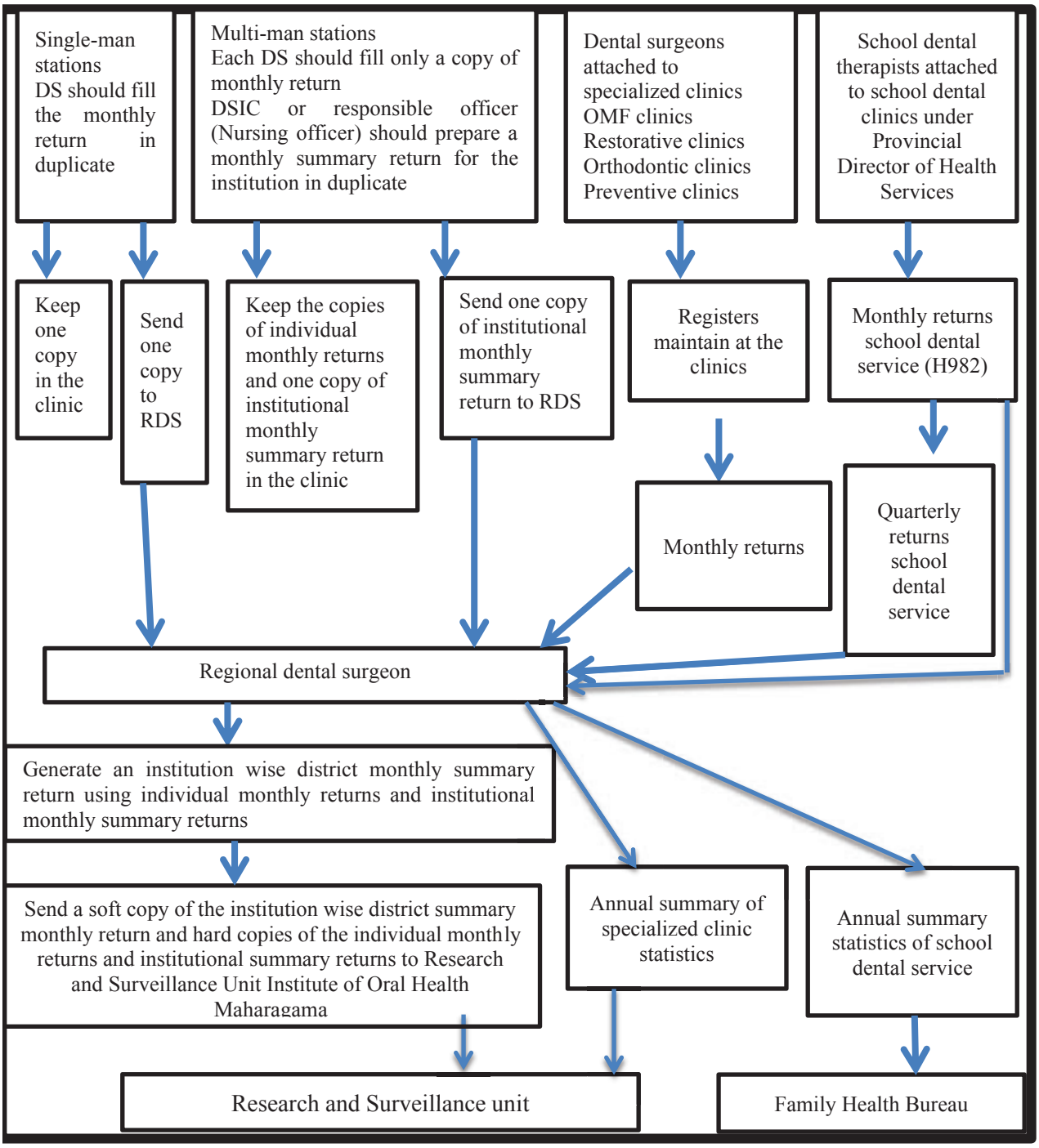


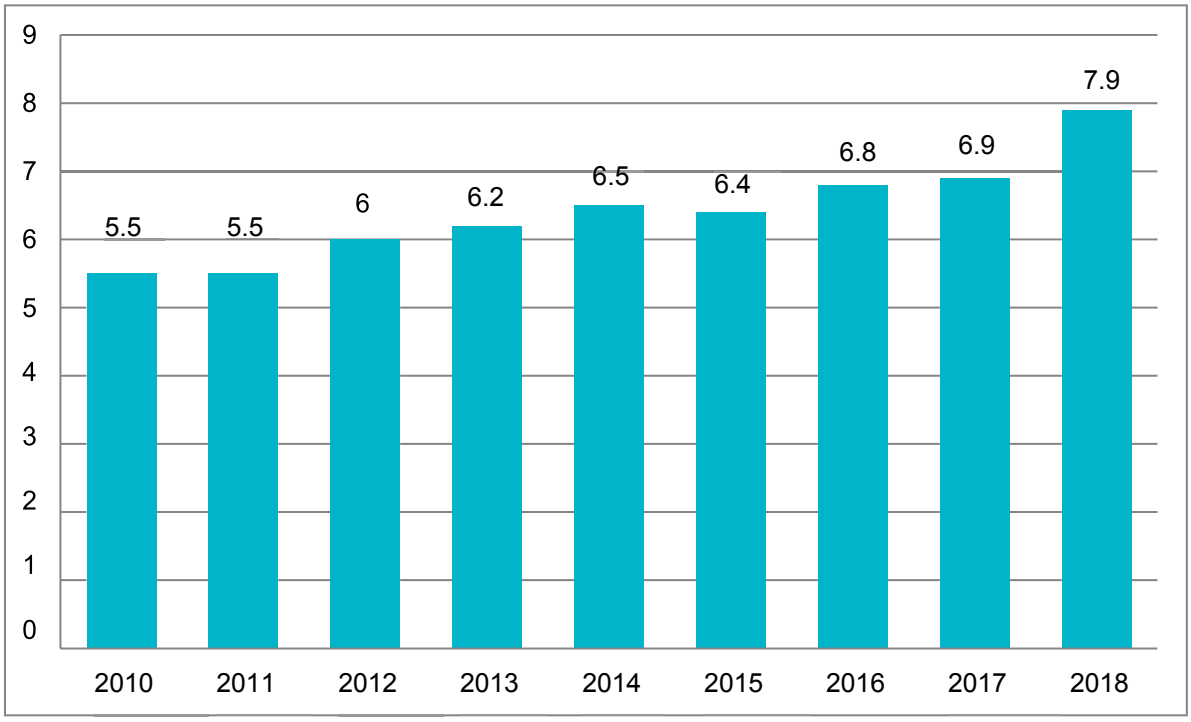
Fig. 2.2: Proposed information flow of the oral health surveillance system



- **Target population**

All Sri Lankans should be cared by the DSs. Distribution of DSs for 100,000 population is explains in the figure 2.3

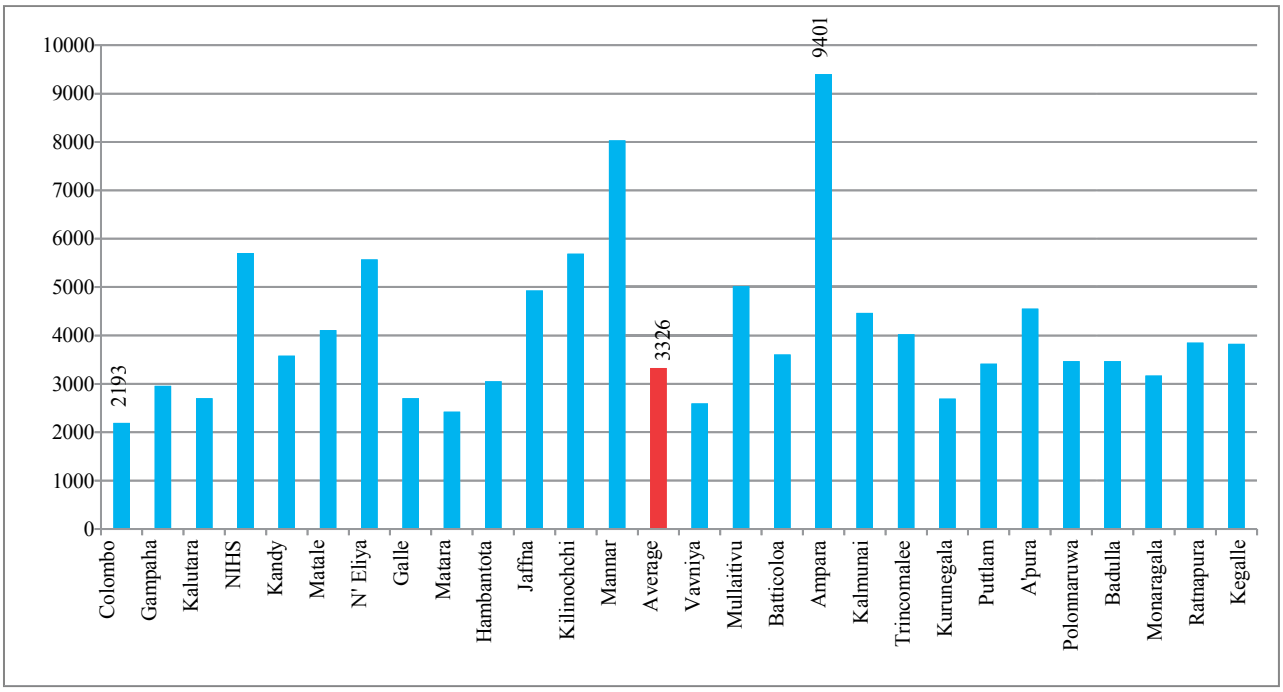
Fig. 2.3 Distribution of dental surgeons per 100,000 population from year 2010 to year 2018



Data source- AHB, 2010-2017 and 2018-unpublished data- Ministry of Health Dental Services

SDT provides preventative care for children aged between 3-13 years. Their target group for treatment is children in grade 1, grade 4 and grade 7 classes in schools where there are more than 200 students and in schools with less than 200 school children all the children below 13 years. The current norm is to have one SDC per one Medical Officer of Health (MOH) division and 2000 target population per SDT.

Fig. 2.4: Target population cared by one SDT during the year 2018: district variation



Even though the norm for target population is 2000 children, the average target population per SDT for Sri Lanka is 3326 children. It varies from 2193 in Colombo district to 9401 in Ampara district.

Chapter 3

Trends in oral health status among Sri Lankan population

Oral disease burden of the country is assessed periodically by the ministry of health by conducting a NOHS representing five age groups as five years, twelve years, fifteen years, adults aged between 35-44 years and elders in the aged between 64 to 75 years. The first NOHS was conducted in 1983/84 and then 1994/95, 2002/2003 and 2015/2016.

Table 3.1- Prevalence and severity of dental caries: comparison of NOHSs

Age group	Dental caries: Percentage prevalence and severity (mean DMFT/dmft)			
	1983-1984	**1994-1995**	**2002-2003**	**2015-2016**
5 / 6 years	78% (4.4)*	76.42 (4.1)*	65.5% (3.6)**	63.1% (3.0)**
12 Years	67% (1.9)	53.1% (1.4)	40% (0.9)	30.4%(0.6)
15 years	***	69.7% (2.5)	52.2% (1.5)	41.5%(1.0)
35-44 years	92% (9.2)	91.1% (10.1)	89.8% (8.4)	92.5% (6.5)
65- 74 years	***	64.5 % (22.5)	71.1% (17.2)	98.3% (18.4)

**Percentage prevalence of dental caries of deciduous teeth (mean dmft) among 6 year olds*

***Percentage prevalence of dental caries of deciduous teeth (mean dmft) among 5 year olds*

**** Age category not included*

According to the table 3.1, dental caries prevalence among children shows a reduction while among adults it is stable and among elders it shows an increasing trend.

Table 3.2- Prevalence of calculus: comparison of NOHSs

Age group	Percentage prevalence of calculus			
	1983-1984	**1994-1995**	**2002-2003**	**2015-2016**
5 / 6 years	*	21.8**	*	13.7***
12 years	76	5.1	49.2	47
15 years	****	52.6	61.8	49.3
35-44 years	55	29.1	64.6	70.7
65- 74 years	****	13.6	31.8	71.6

** Not recorded ** Prevalence of calculi of deciduous teeth among 6 year olds *** Prevalence of calculi of deciduous teeth among 5 year olds **** Age category not included*

As shown in table 3.2, the prevalence of calculus shows an increasing trend among adults and elders while there is a reduction in the prevalence of calculi among 12 and 15 year olds from 2002-2003 to 2015-2016.

Table 3.3- Distribution of oral health related behaviors of individuals: comparison of NOHSs

Oral health related behaviors	Age category				
	5/6 years	**12 years**	**15 years**	**35-44 years**	**65- 74 years**
Brushing teeth: 2/day *(NOHS 2015/16)*	53.9*	50.1	55.8	73.3	55.0
Using tooth brush *(NOHS 1994-95)*	85.66**	89.07	92.64	72.18	29.51
Using tooth brush *(NOHS 2015/16)*	96.7*	97.5	98.4	95.9	70.4
Using fluoride toothpaste *(NOHS 2015/16)*	75.6*	80.0	82.1	79.3	59.0

** 5 year olds **6 year olds*

Frequency of tooth brushing has been surveyed only in the 2015/2016 NOHS and it has been found that only 50.1% of 12 year olds brush twice a day.

Percentage of people use a tooth brush to clean teeth shows an increasing trend among all age groups when NOHS 1994-95 data is compared with data of NOHS 2015-16. There is a substantial increase in the usage of tooth brushes among the elders (age group of 64-75 years) from 29.51% in 1994-95 to 70.4% in 2015-16.

The average percentage of people use fluoridated tooth paste is ranged from 59.0 % (age group of 64-75 years) to 82.1% (age group of 15 years).

Table 3.4- Prevalence of fluorosis: comparison of NOHSs

Age group	Percentage prevalence of fluorosis			
	1983-1984	**1994-1995**	**2002-2003**	**2015-2016**
12 years	10.4	4.9	10.8	9.2
15 years	*	6.3	5.7	7.9

**Age category not included*

Percentage prevalence of fluorosis shows a reduction among 12 year olds and an increase among 15 year olds when data of NOHS 2002-2003 and NOHS 2015-2016 are compared.

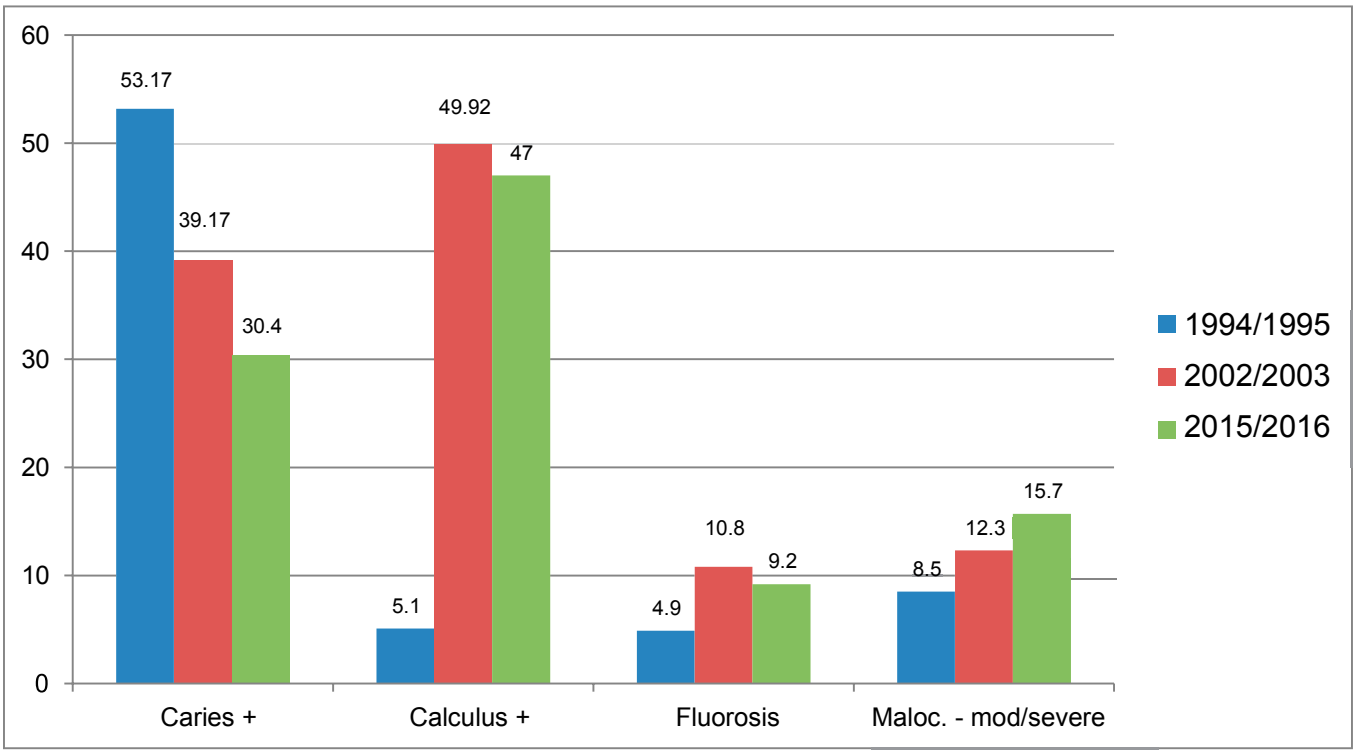
Table 3.5- Prevalence of malocclusion: comparison of NOHSs

Age group	Percentage prevalence of moderate to severe malocclusion			
	1983-1984	**1994-1995**	**2002-2003**	**2015-2016**
12 Years	*	8.5	12.3	15.7
15 years	**	10.2	10.6	13.1

** Not recorded, **Age category not included*

Percentage prevalence of moderate to severe malocclusion shows an increasing trend among both age groups of 12 years and 15 years with time.

Fig. 3.1: Percentage distribution of 12 year olds according to prevalence of selected oral diseases: comparison of NOHSs



The prevalence of caries of 12 year old children has declined during 20 years from 1994 and moderate to severe malocclusion has increased during the same period of time. Prevalence of calculi among 12 year olds has reached almost 50% which may be contributed by the frequency of brushing as shown in table 3.3

Table 3.6- Distribution of variables related to tooth loss: comparison of NOHSs

Variable	Age group	Results of NOHSs			
		1983-1984	1994-1995	2002-2003	2015-2016
Mean number of missing teeth	35-44 years	5.2	5.8	4.93	4
	65- 74years	*	20.4	15.21	16.5
Percentage of individuals with tooth loss	35-44 years	*	82	81.1	82.4
	65- 74years	*	97.1	95.9	97.5
Percentage of individuals wearing partial dentures	35-44 years	*	11.3	10.2	7.4
	65- 74years	*	5.2	7.7	11.6
Percentage of individuals wearing full dentures (upper or lower or both)	35-44 years	10.8	4.1	0.5	0.2
	65- 74years	*	20.0	15.7	4.8
Percentage of total edentulism	65- 74years	*	36.9	21.8	11.3
Percentage of individuals wearing upper and lower full dentures	65- 74years	*	5.8	**	3.1

***** *Age category not included ** Not recorded*

Even though the mean number of missing teeth shows an improving trend, it is considerably higher among the adult age group of 65-74 years compared to 35-44 year olds. Percentage of tooth loss shows a stable trend between all 4 surveys while complete edentulism shows an improving trend.

According to the results of 2015-16 NOHS, even though there were 11.3% completely edentulous people in the age group of 65-74 years, only 3.1% were wearing complete dentures for both arches.

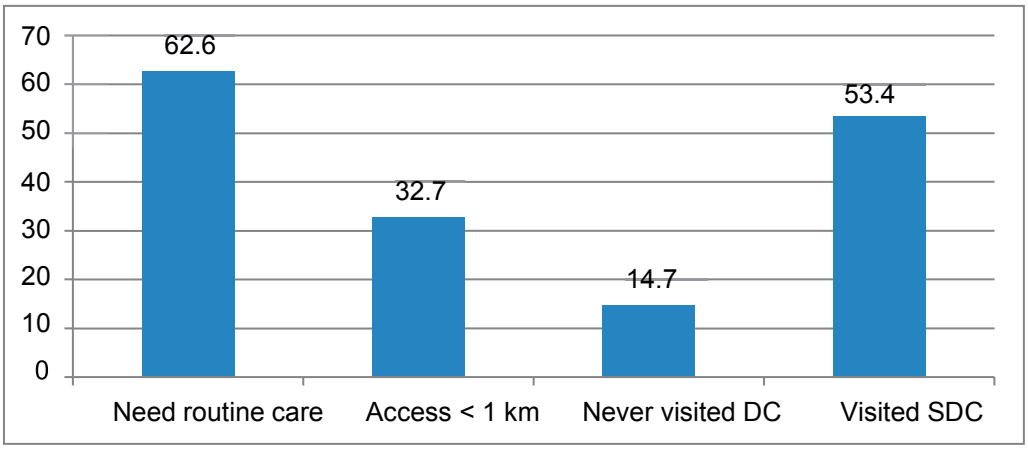
Table 3.7- Use of oral healthcare services: comparison of NOHSs

Utilization pattern of oral healthcare services	Age group	Results of NOHS data			
		1983-1984	1994-1995	2002-2003	2015-2016
Access to the nearest government dental clinic within 5 Km	12 Years	*	*	34.5	67.3
	15 years	**	*	41.8	65.3
	35-44 years	*	*	43.4	64
	65- 74years	**	*	45.6	65.2
Percentage of last visit to a dental clinic within last year	12 Years	*	35.2	43.12	59.6
	15 years	**	16.1	13.74	31.4
	35-44 years	*	25.7	25.66	30.9
	65- 74years	**	9.8	12.59	18.4

**Not recorded ** Age category not included*

Accessibility to a government dental clinic has increased. According to 2015-2016 data averagely around 65% people in all age groups have access to a government dental clinic within 5 km. Utilization of oral healthcare services also shows an increasing trend among all age groups.

Fig. 3.2: Percentage distribution of 12 year olds according to selected data obtained from NOHS 2015-2016, related to usage of oral healthcare services



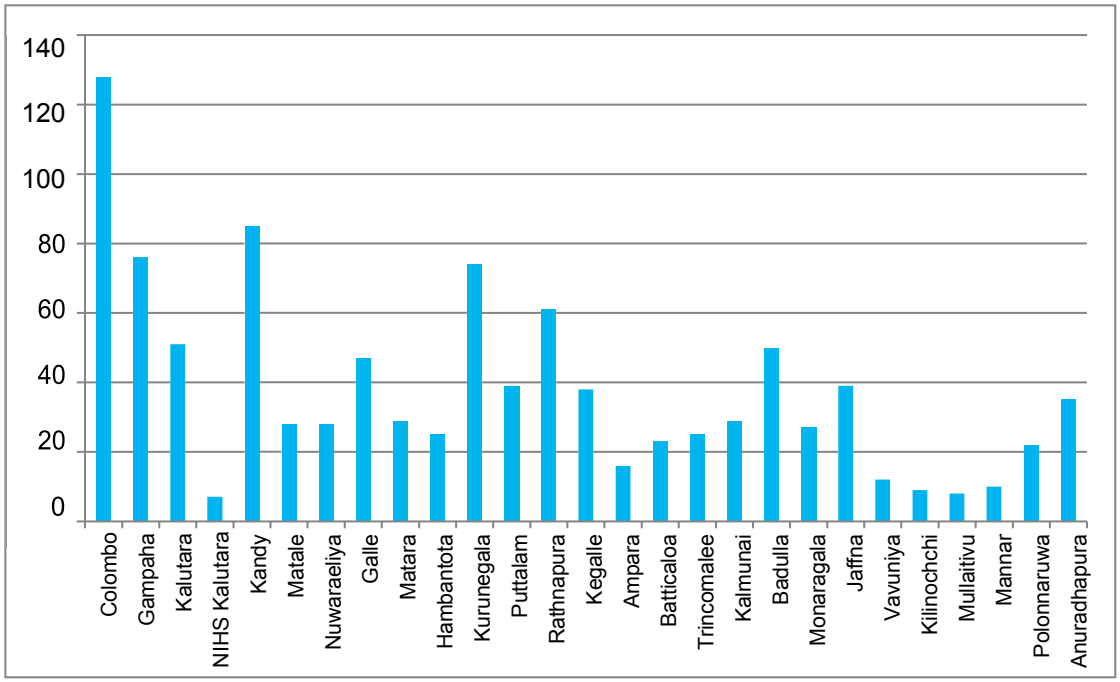
According to data available in the NOHS 2015-2016, nearly two third of 12 year old children are needed routine oral healthcare. One third of these children have access to an oral healthcare facility within 1 km. Although SDT should screen children in grade 1, 4 and 7, nearly half of 12 year olds have never visited a SDC.

Chapter 4

Curative oral healthcare

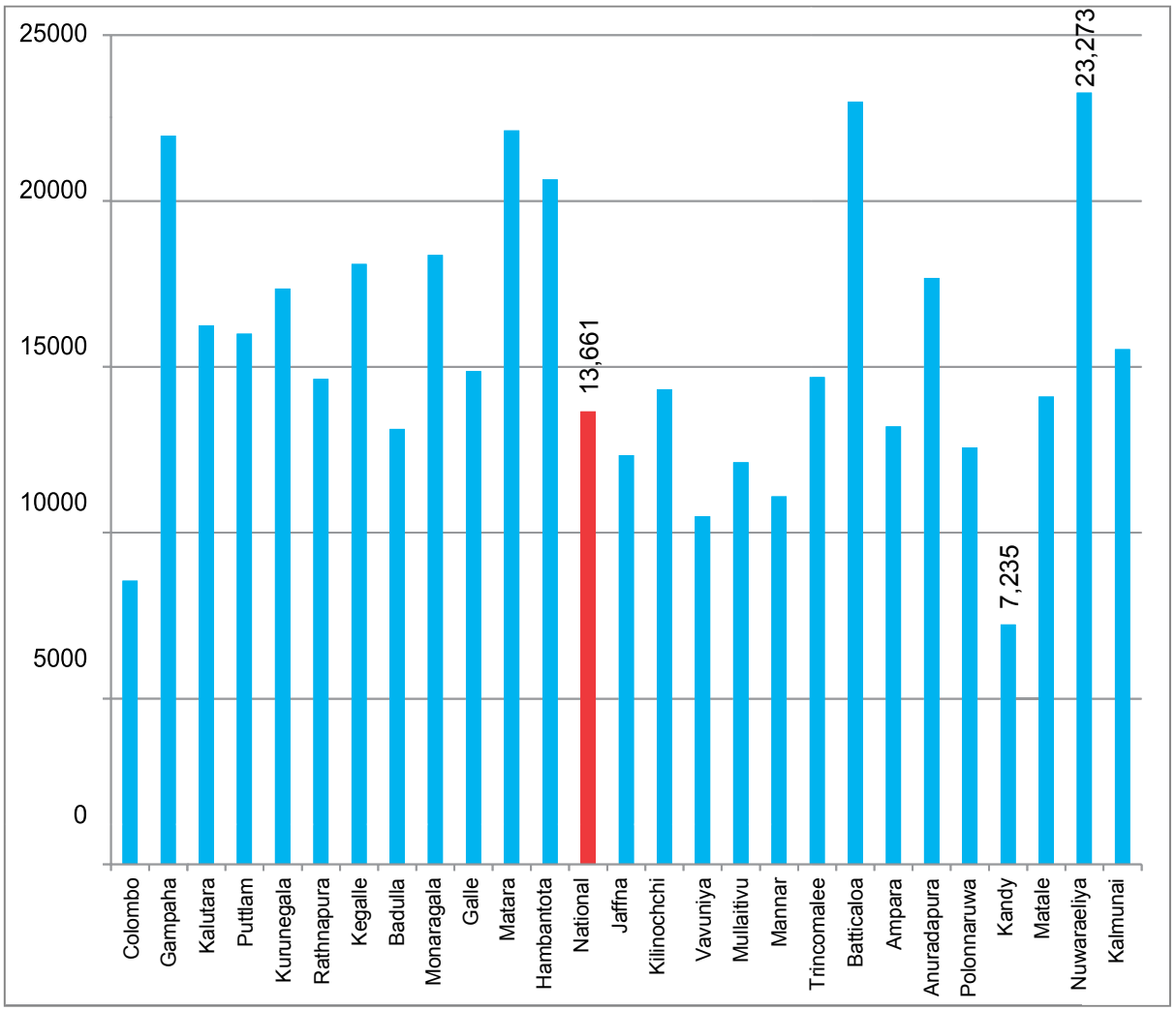
4.1 Distribution of dental surgeons providing OPD care

Fig. 4.1: Distribution of OPD dental surgeons under the Provincial and line ministry hospitals in Sri Lanka



There were 1021 DS practicing clinical dentistry in 735 government dental clinics in Sri Lanka at the end of 2018. There are 226 DSs working in hospitals under the Line ministry and 795 DSs working in the hospitals under the provincial council. Distribution of DSs within the country shows a pattern of mal-distribution. Majority of DSs are working in Colombo and Kandy districts, followed by Gampaha and Kurunegala.

Fig. 4.2: Population cared by one dental surgeon in year 2018: district variation

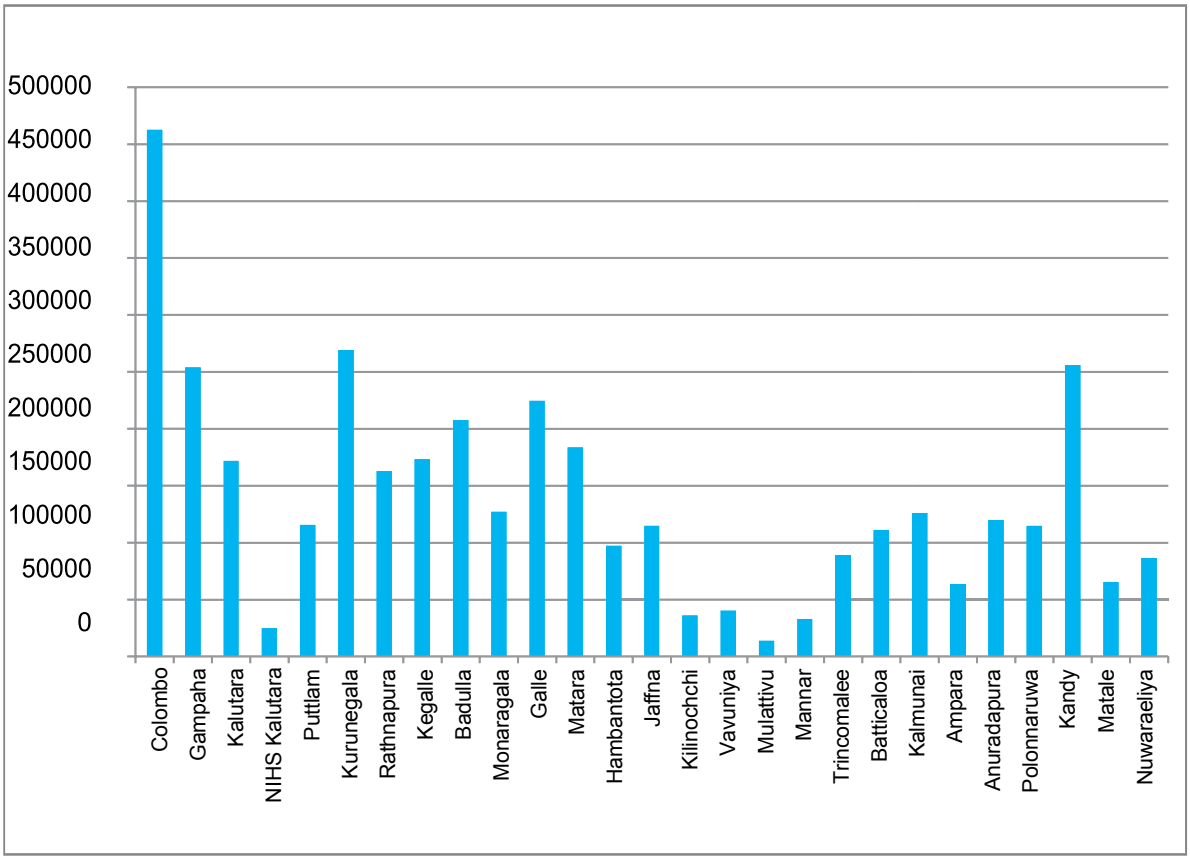


There were 1596 dental surgeons attached to the ministry of health by the end of 2018. Considering the population of Sri Lanka as 21.8 million, the national figure of dentist to population ratio is 13,661 individuals per dental surgeon. When district figures are considered, they varied from 7,235 population per dental surgeon in Kandy district to 23,273 in Nuwaraeliya district. Gampaha, Matara, Hambantota and Batticaloa districts also have figures above 20,000 population per dental surgeon.

4.2 Performances of government dental surgeons during 2018

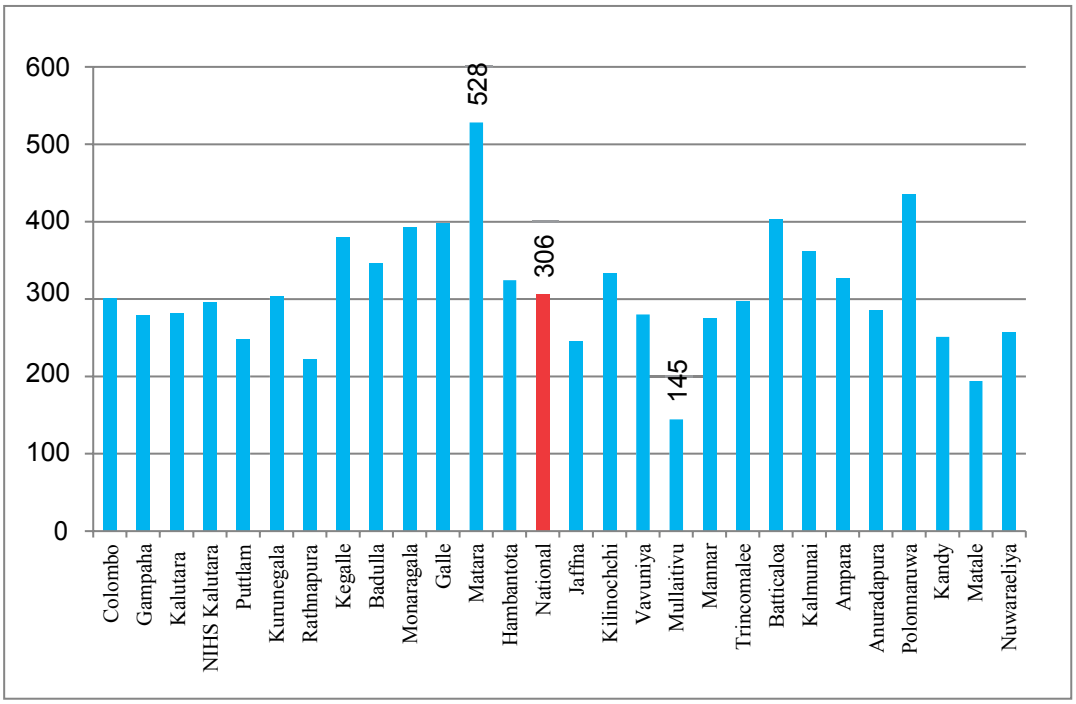
4.2.1 Performance of dental surgeons during 2018 according to the type of treatment

Fig. 4.3: Total number of patients treated by dental surgeons during the year 2018



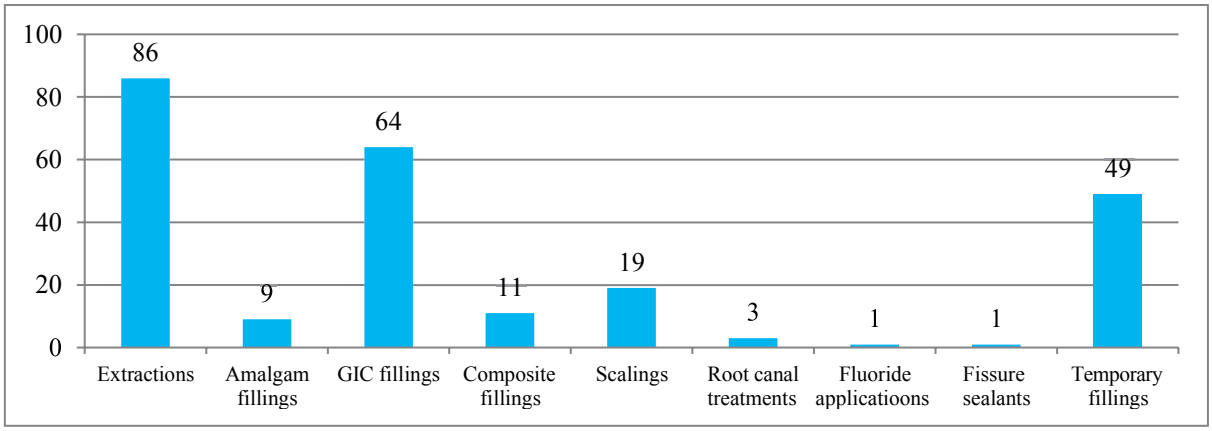
There were 3,744,466 patients attended government dental clinics during 2018. Considering the district figures, during 2018, total number of patients treated by dental surgeons varied from 13,872 in the district of Mullaitivu to 462,733 in the district of Colombo. Total number of patients treated exceeds 250,000 for districts of Colombo, Gampaha, Kurunegala and Kandy.

Fig. 4.4: Monthly average number of patients treated by one dental surgeon during the year 2018: district variation



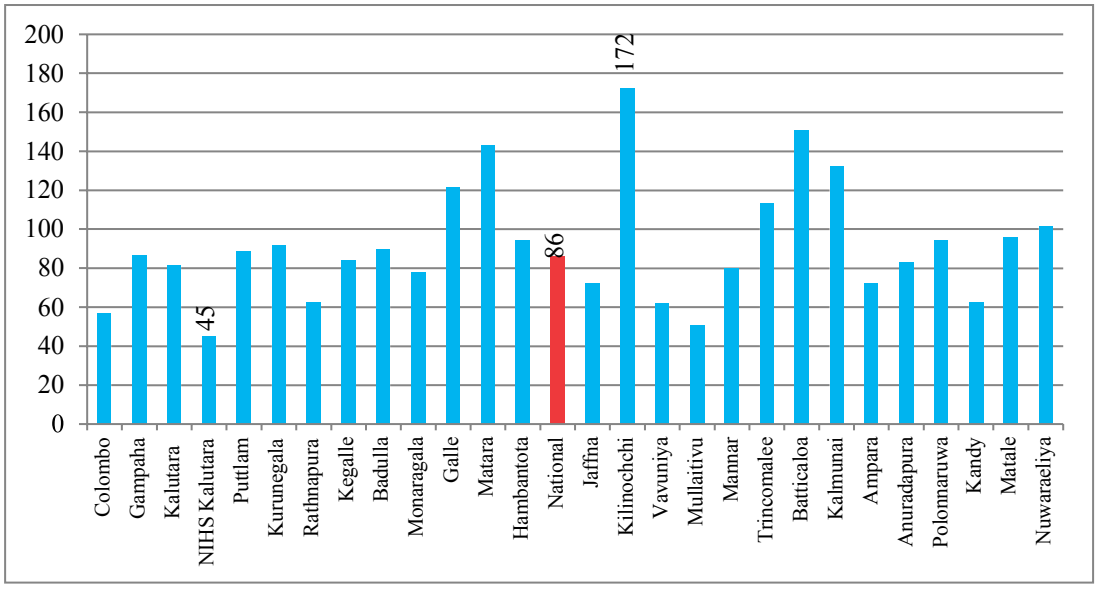
National monthly average number of patients treated by a dental surgeon is 306 and it varied from 145 in Mullaitivu to 528 in Matara district.

Fig. 4.5: Monthly average number of treatments done by one dental surgeon during the year 2018



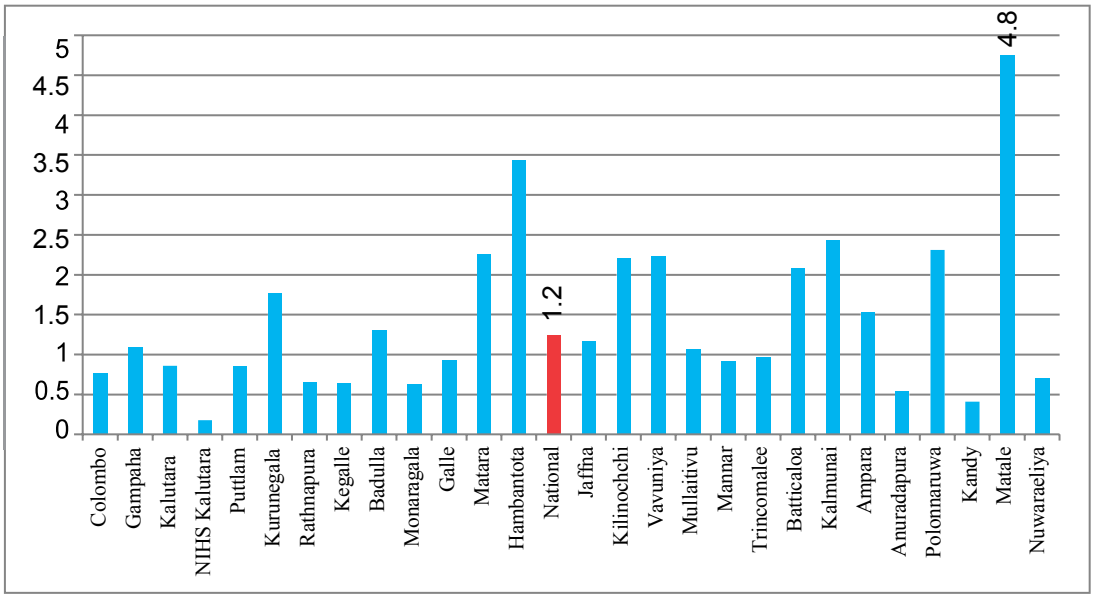
On average a dental surgeon had extracted 86 teeth per month during 2018. Monthly average number of glass ionomer cement fillings done was 64, while the number of temporary fillings done was 49. A dental surgeon had done 19 scalings, 11 composite fillings, 9 amalgam fillings and 3 root canal treatments a month during 2018.

Fig. 4.6: Monthly average number of extractions done by one dental surgeon during the year 2018: district variation



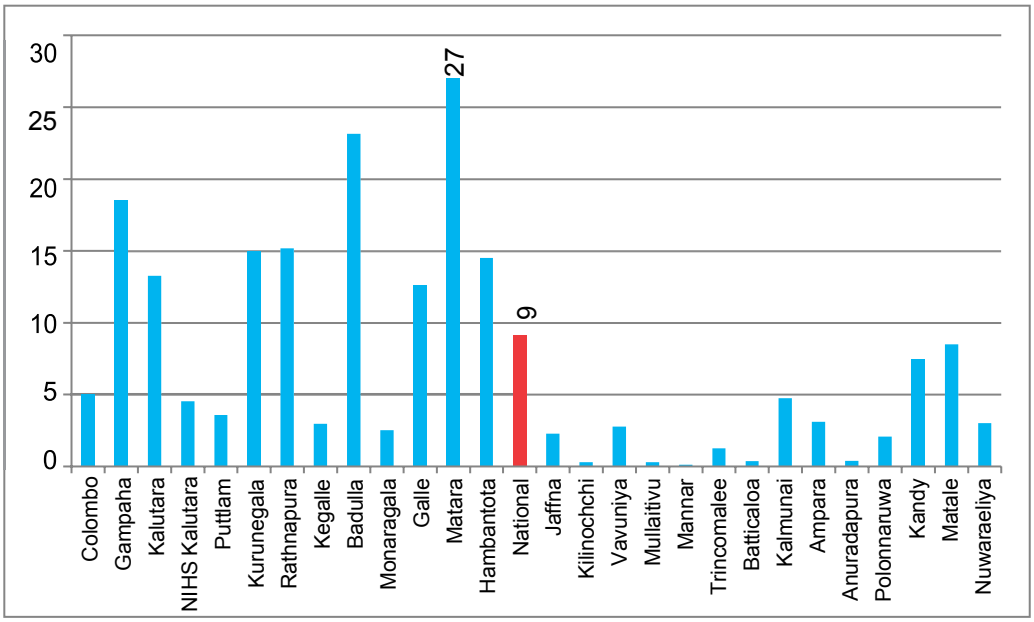
on average 86 extractions had been performed by a dental surgeon per month during 2018. It had varied from 45 extractions in National Institute of Health Sciences (NIHS) Kalutara area to 172 extractions in Kilinochchi district.

Fig. 4.7: Monthly average number of post -operative infections and bleeding reported, by a dental surgeon during the year 2018: district variation



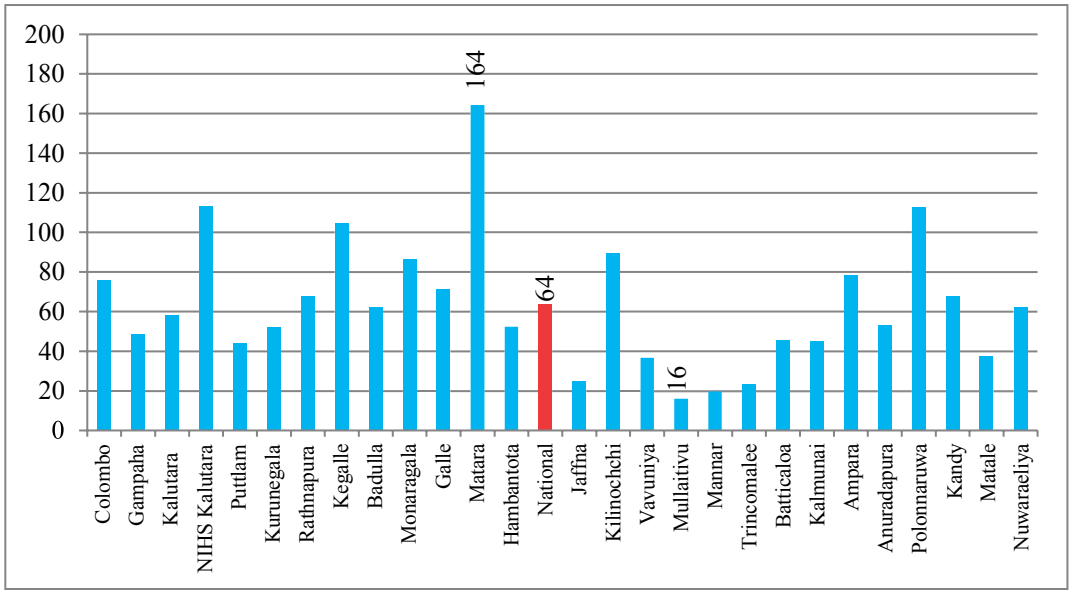
According to the monthly statistics submitted by dental surgeons for 2018, the average number of post-operative infections and bleeding reported was 1.2. The highest figure was for Matale district.

Fig. 4.8: Monthly average number of Amalgam fillings done by one dental surgeon during the year 2018: district variation



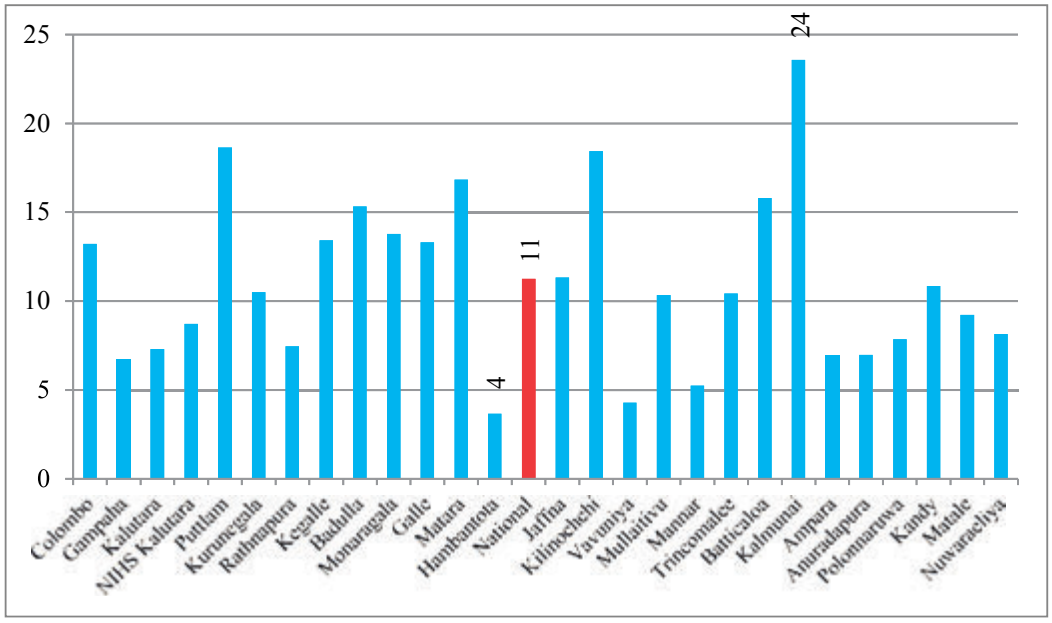
Average number of amalgam fillings done by a dental surgeon per a month during 2018 was 9. The highest number of amalgam fillings were done in Matara district while in Killinochchi, Mullaitivu, Mannar, Batticaloa and Anuradhapura districts amalgam fillings were rarely done.

Fig. 4.9: Monthly average number of Glass Ionomer Cement (GIC) fillings done by one dental surgeon during the year 2018: district variation



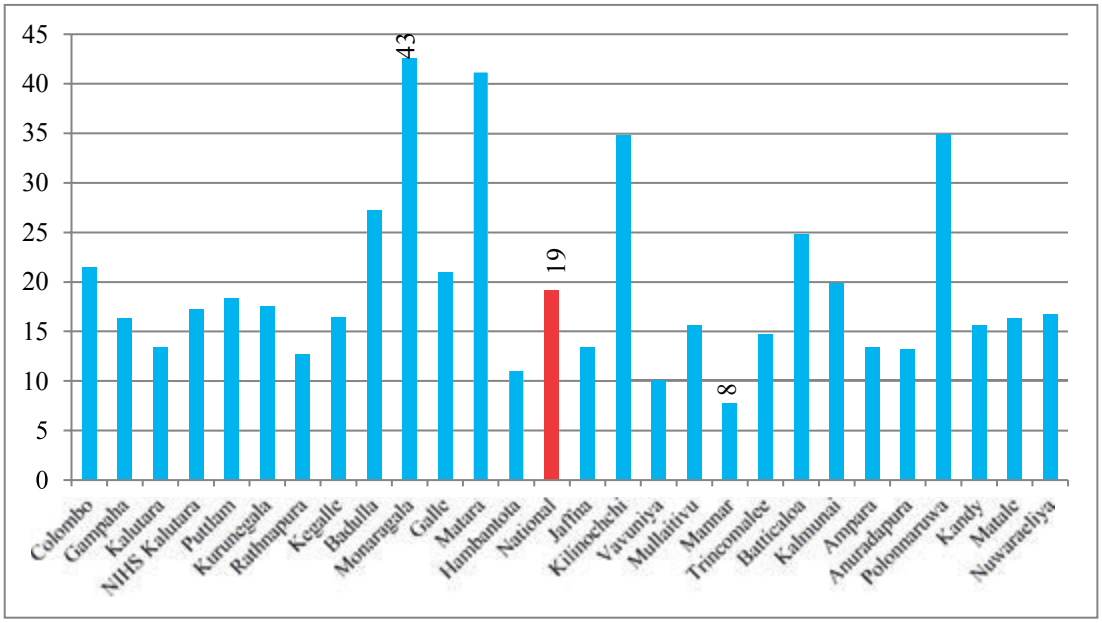
On average 64 GIC fillings were done by a dental surgeon per a month during 2018. It varied from 16 GIC fillings per month per dental surgeon in Mulattivu district to 164 GIC fillings per month per dental surgeon in Matara district.

Fig. 4.10: Monthly average number of Composite fillings done by one dental surgeon during the year 2018: district variation



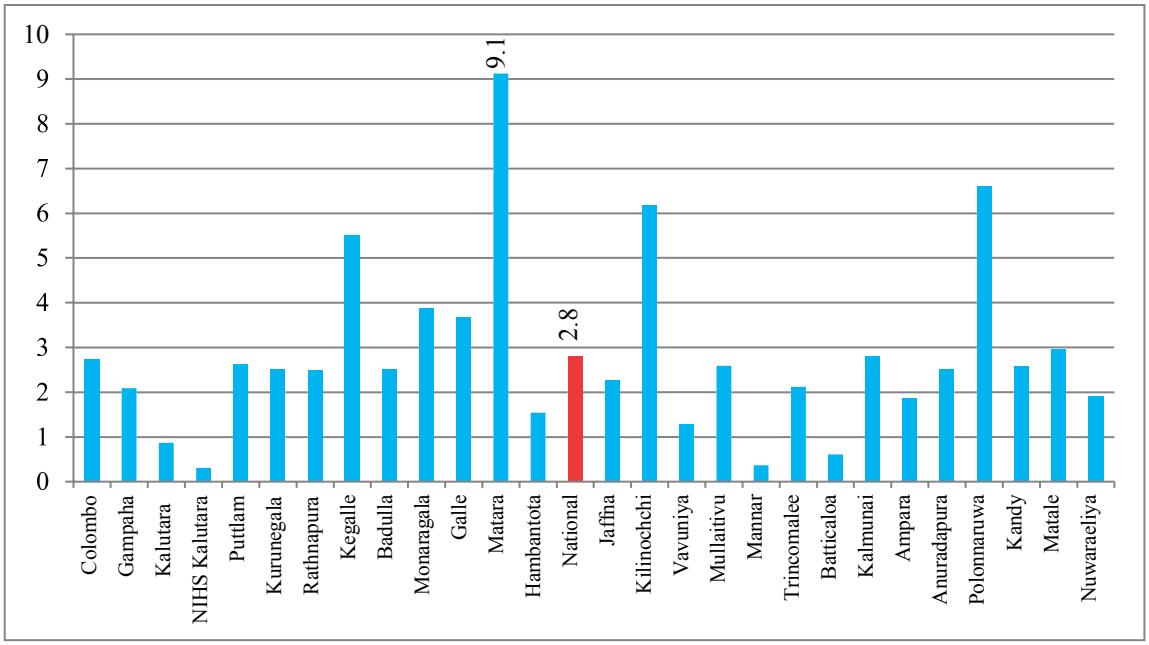
Eleven composite fillings were done by a dental surgeon per month during 2018. It ranged from 4 composite fillings in the district of Hambantota to 24 composite fillings in Kalmunai district.

Fig. 4.11: Monthly average number of scalings done by one dental surgeon during the year 2018: district variation



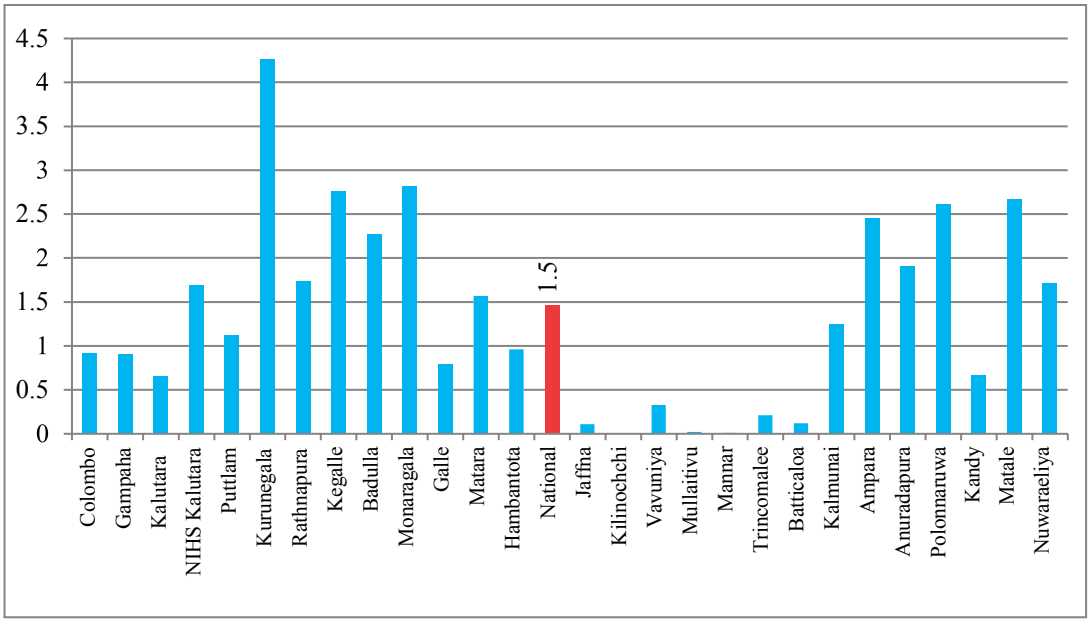
Monthly average number of scalings done by a dental surgeon during 2018 was 19. It varied from 8 in Mannar district to 43 in Monaragala district.

Fig. 4.12: Monthly average number of completed root canal treatments done by one dental surgeon during the year 2018: district variation



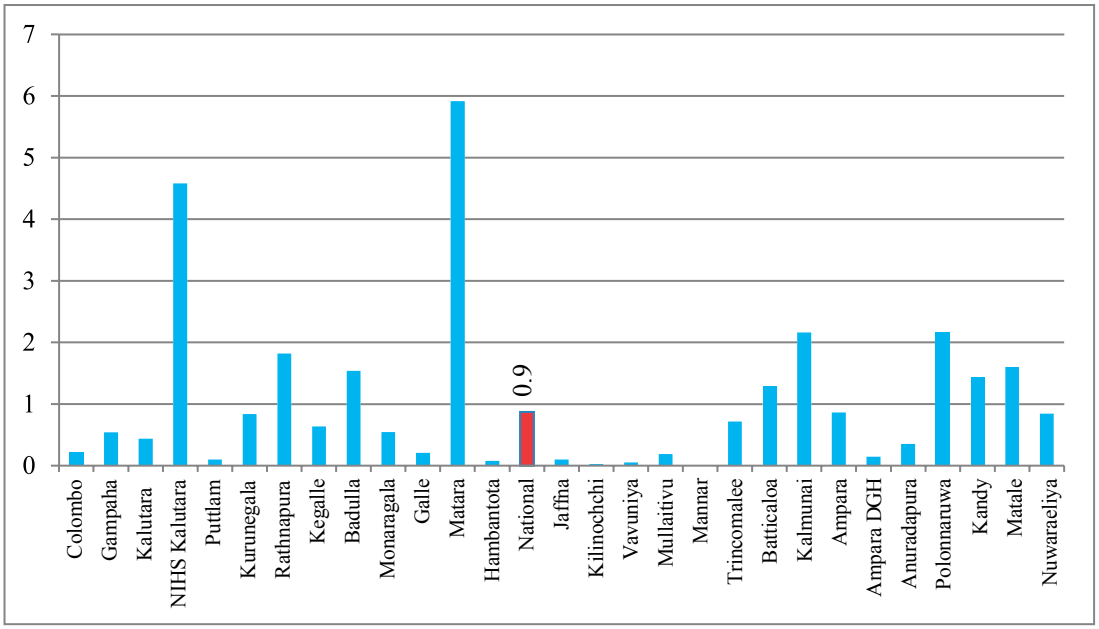
Monthly average number of root canal treatments performed was 2.8 and it varied from less than 1 in Mannar, Batticaloa and NIHS Kalutara districts to 9.1 in the district of Matara.

Fig. 4.13: Monthly average number of fluoride applications done by one dental surgeon during the year 2018: district variation



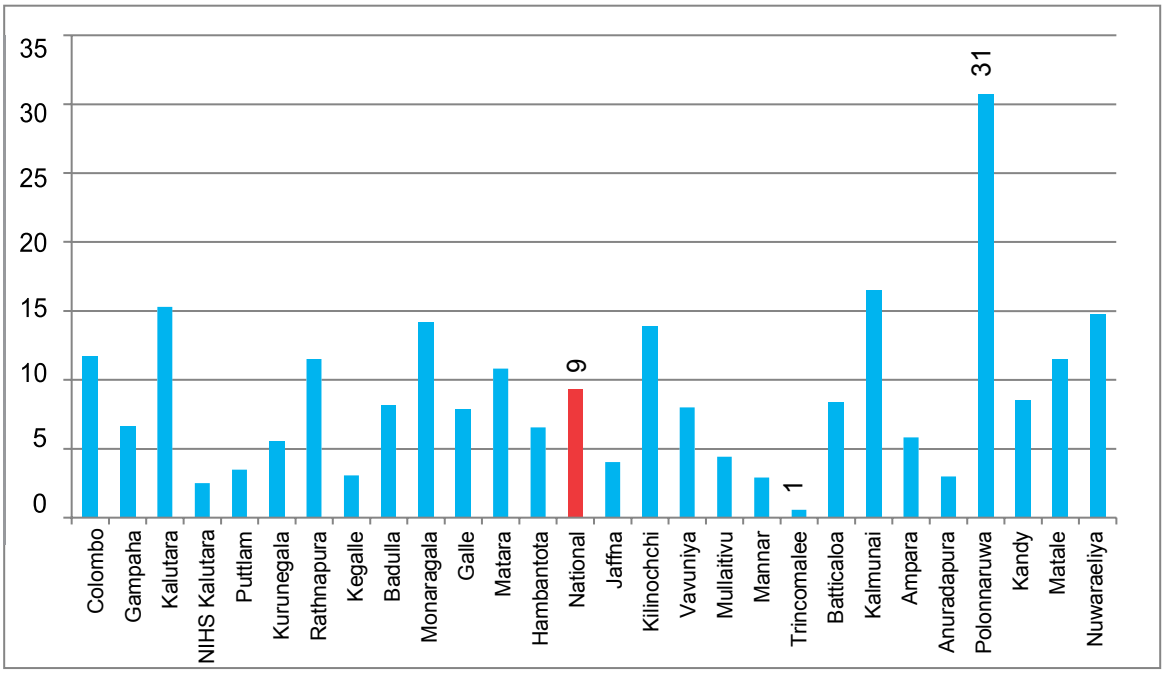
On average a dental surgeon had done 1.5 fluoride applications a month during 2018. The highest number of fluoride applications was done in Kurunegala district.

Fig. 4.14- Monthly average number of fissure sealants performed by one dental surgeon during the year 2018: district variation



On average, a dental surgeon had done 0.9 fissure sealant applications during a month in the year 2018. The highest number of fissure sealant applications was done in Matara district.

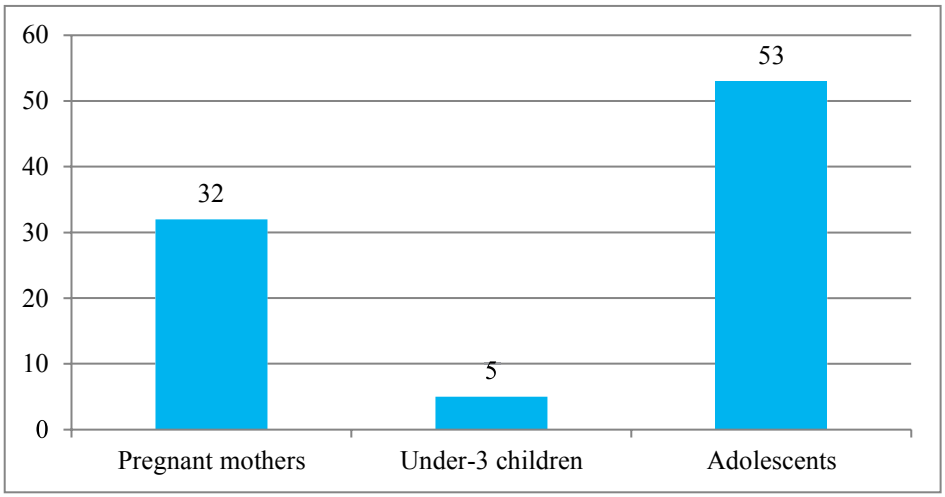
Fig. 4.15: Average number of cases of Oral Potentially Malignant Disorders (OPMDs) identified in a clinic during the year 2018: district variation



Average number of OPMD cases identified in a clinic during 2018 was 9. The highest number of cases were identified from Polonnaruwa district (31 cases) while the lowest was reported from Trincomalee district (1 case).

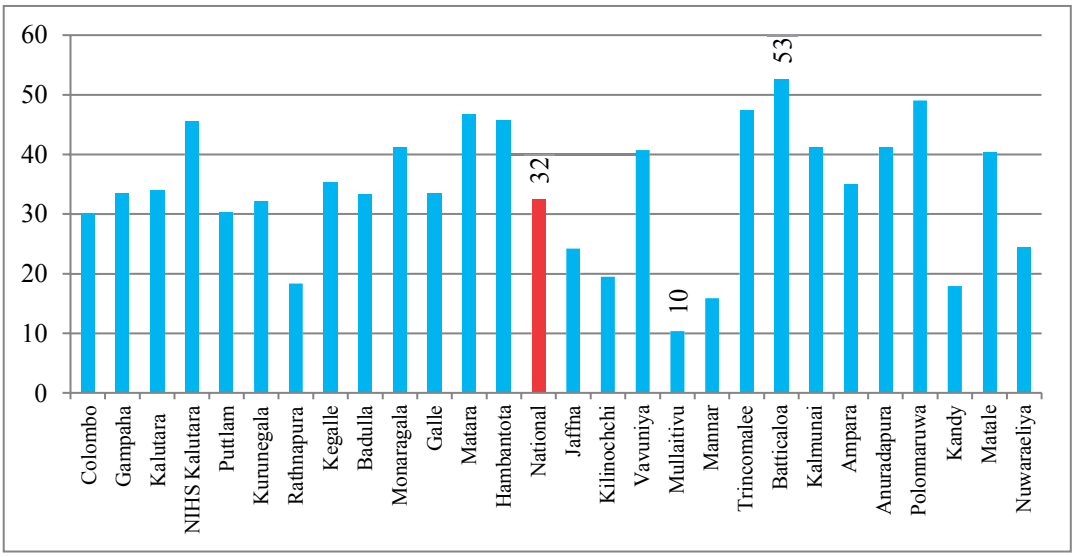
4.2.2 Performance of dental surgeons during the year 2018 according to the type of patients

Fig. 4.16: Number of pregnant mothers, children under 3 years of age and adolescents (13-19 year olds) treated in a clinic during a month in year 2018



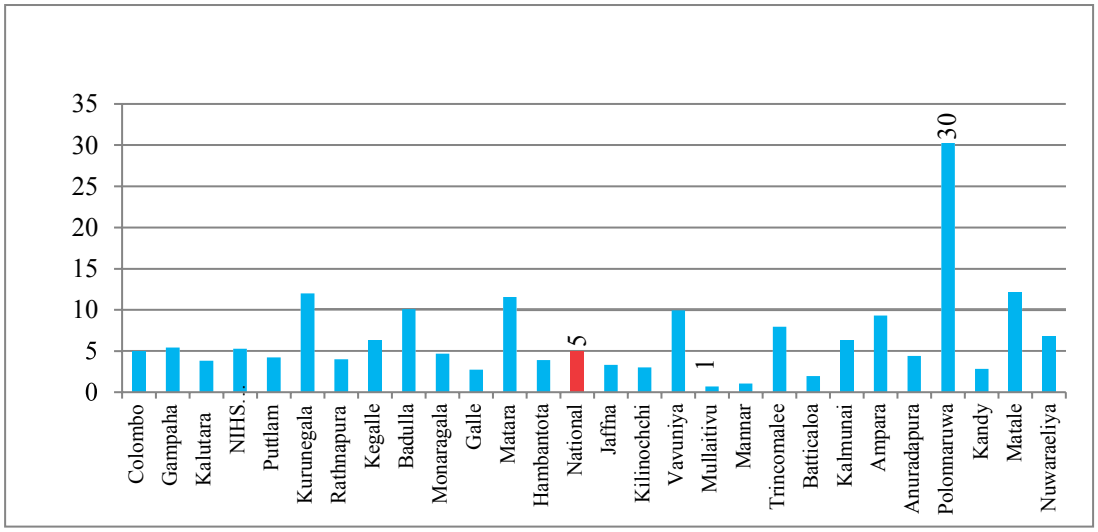
Average number of pregnant mothers treated in a government dental clinic during 2018 was 32. On average 5 children, less than 3 years and 53 adolescents, were treated in a government dental clinic during 2018.

Fig.4.17: Number of pregnant mothers treated in a clinic during a month in year 2018: district variation



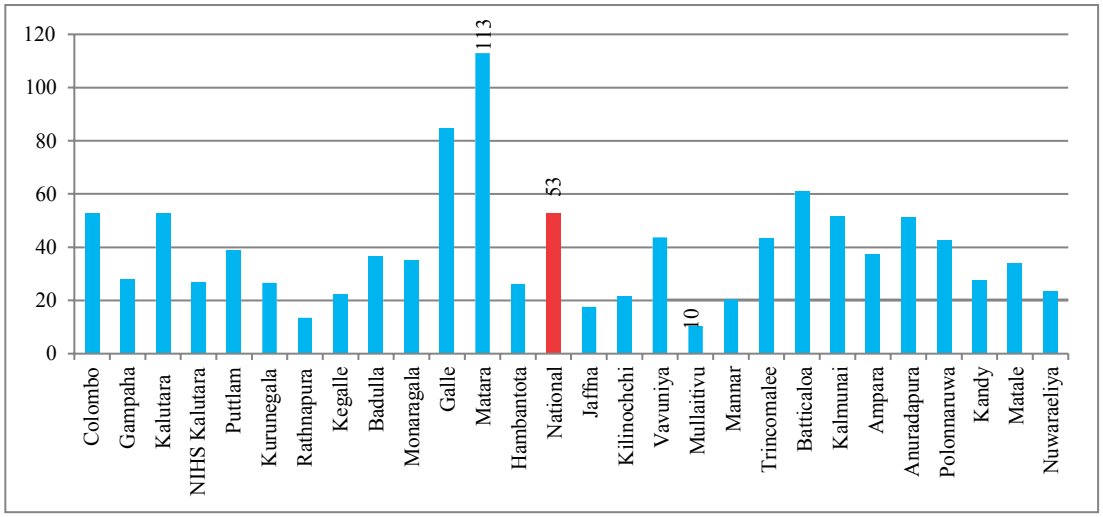
The district which treated the highest number of pregnant mothers (53) was Batticaloa, while the lowest number (10) was from Mullaitivu district.

Fig. 4.18: Number of children under 3 years of age treated in a clinic during a month in year 2018: district variation



The highest number of children under 3 years of age was treated in the district of Polonnaruwa, which was 30, while the lowest number was from Mullaitivu district which was only one child under 3 years of age per month per clinic.

Fig. 4.19: Number of adolescents (13-19 year olds) treated in a clinic during a month in year 2018: district variation



The highest number of adolescents was treated in the district of Matara which was 113 per month per clinic, while the lowest number was from Mullaitivu district which was 10.

4.2.3 Performance of dental surgeons during the year 2018 according to the type of hospitals

Types of hospitals

Type 1 – National Hospitals in Sri Lanka, Teaching Hospitals, Provincial General Hospitals, District General Hospitals, Base Hospitals

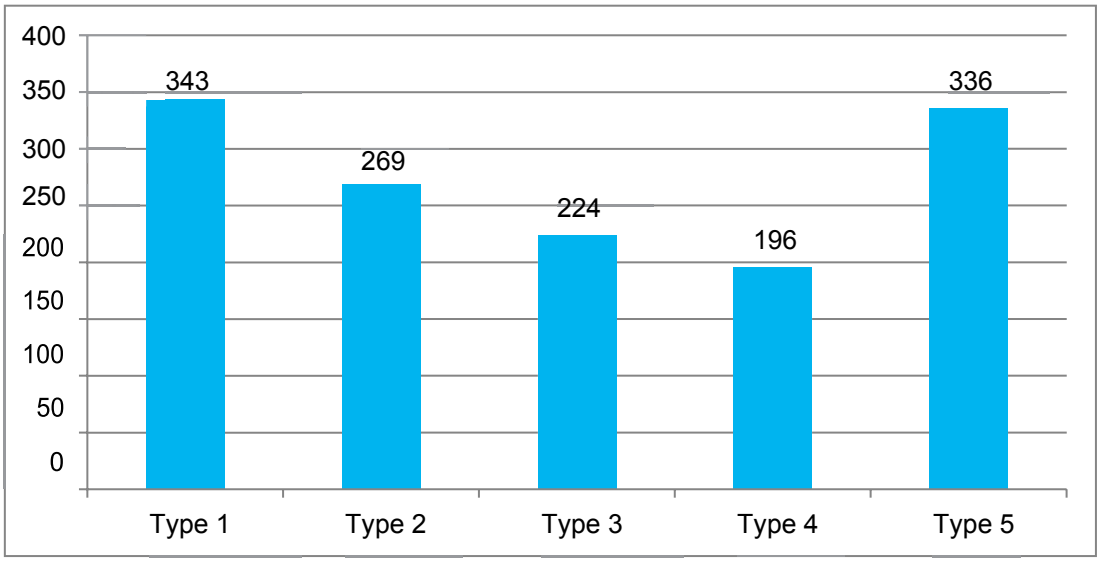
Type 2 – Divisional Hospitals and Primary Medical Care Units

Type 3 – Adolescent Dental Clinics

Type 4 – Community Dental Clinics and Dental Clinics under Medical Officer of Health

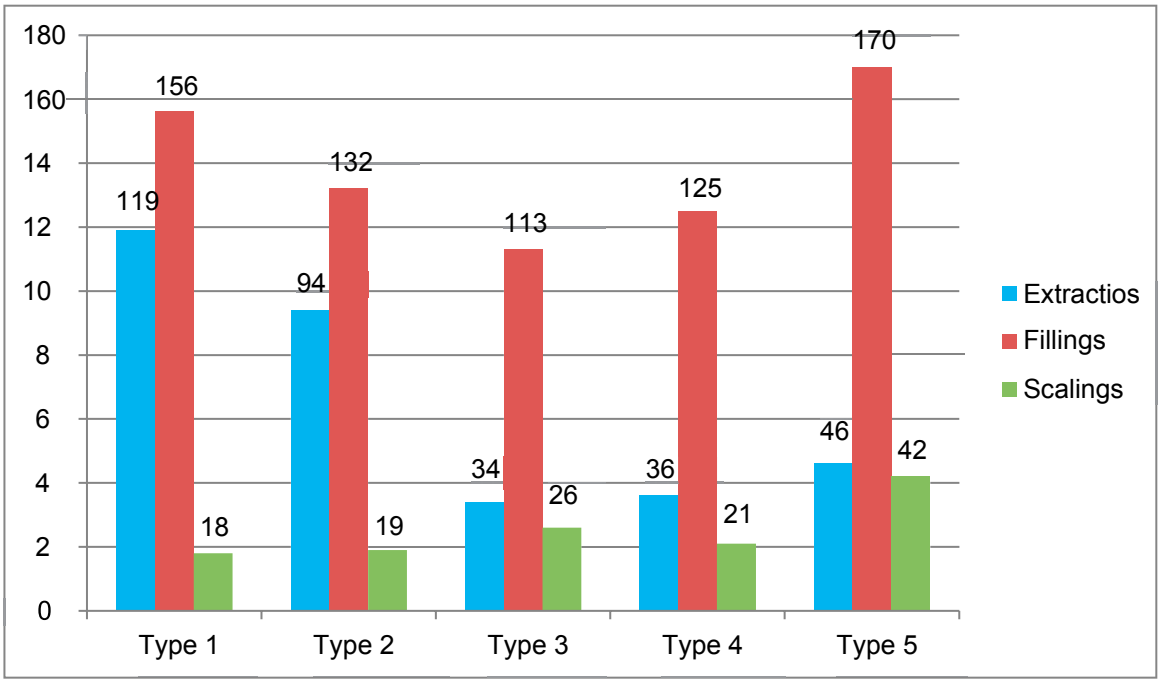
Type 5 – Mobile Dental Clinics

Fig. 4.20: Total number of patients treated by one dental surgeon during a month in year 2018 according to the type of hospital



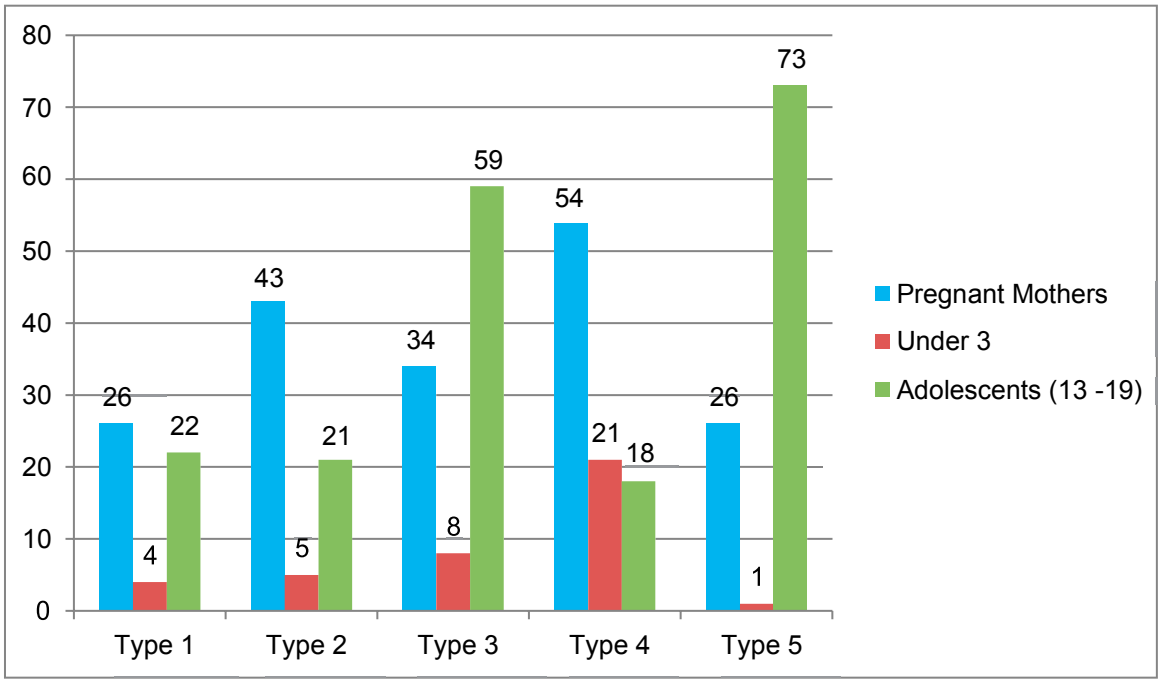
A dental surgeon attached to type 1 hospitals treated the highest number of patients (343) per month. Although the number of patients attended by a dental surgeon working in mobile dental clinic was 336, it included those patients who were screened. On average, dental surgeons attached to CDC and Dental Clinics under MOH had treated the least number of patients per month (196).

Fig.4.21: Treatments done by a dental surgeon during a month in year 2018 according to the type of hospital



The highest number of extractions (343) per month was performed by dental surgeons attached to type 1 hospitals. The least number of extractions (34) per month was performed by dental surgeons attached to ADCs. The highest number of fillings (170) per month was performed by dental surgeons attached to mobile dental clinics. The number of scalings performed per month was also highest in mobile dental clinics (42).

Fig.4.22: Total number of different types of patients treated in dental clinics during a month in year 2018 according to the type of hospital



The pregnant mother attendance was highest per month in type 4 dental clinics (Community Dental Clinics and Dental Clinics under MOH). Overall, the attendance of children under 3 years of age to dental clinics was very low with the highest (21) being in type 4 dental clinics. The monthly attendance of adolescents was highest (73) in mobile dental clinics which was higher than those attended to Adolescent Dental Clinics (59).

Fig. 4.23: Total number of OPMD cases reported in year 2018 according to the type of hospital

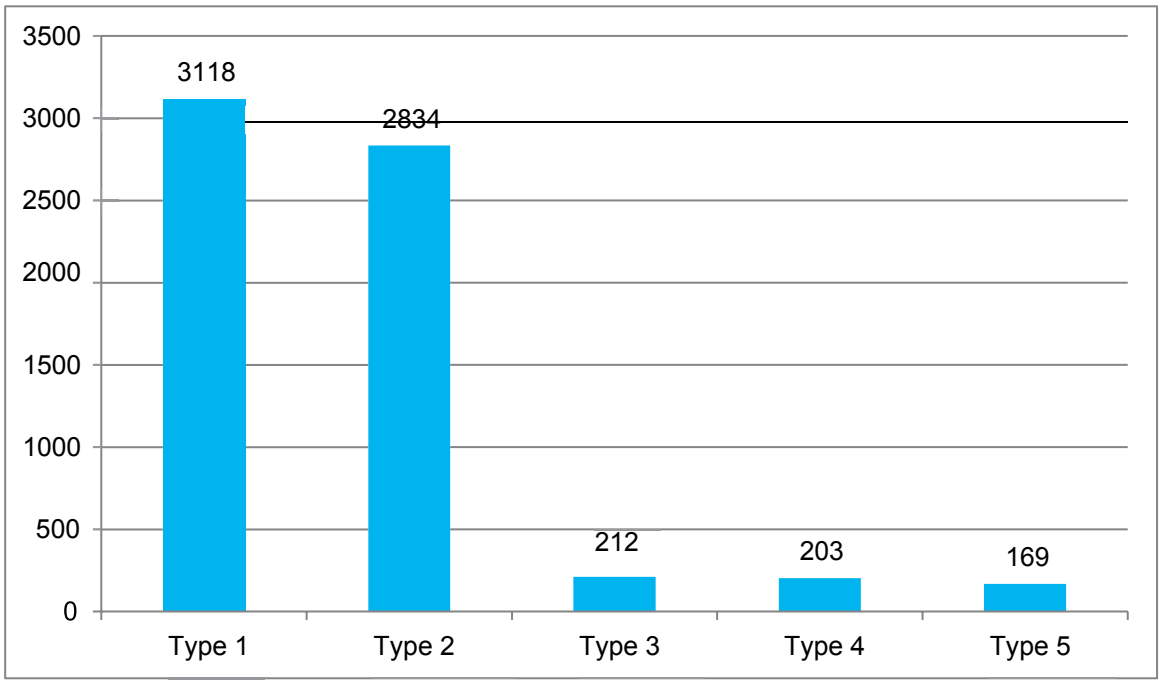
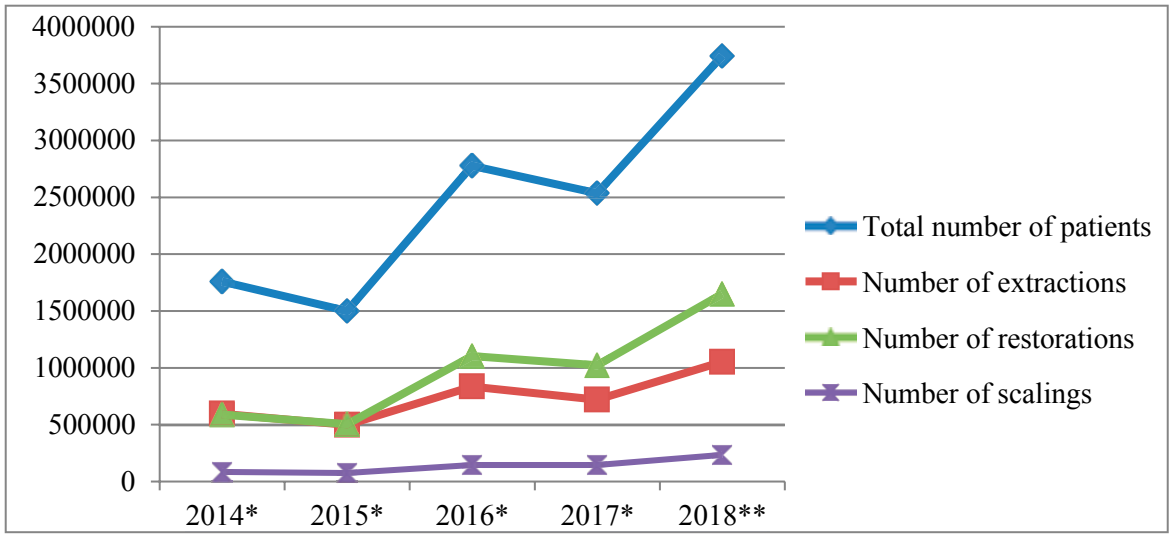


Figure 4.23 shows the distribution of OPMD cases attended to government hospitals in 2018 according to the type of hospitals. The number of OPMD cases was highest (3118 OPMD cases in 2018) in type 1 hospitals while it was very low in Adolescent Dental Clinics, Community Dental Clinics, Dental Clinics under MOH and Mobile Dental Clinics.

Annual performance of dental surgeons

Fig. 4.24: Performance of dental surgeons from 2014 to 2018

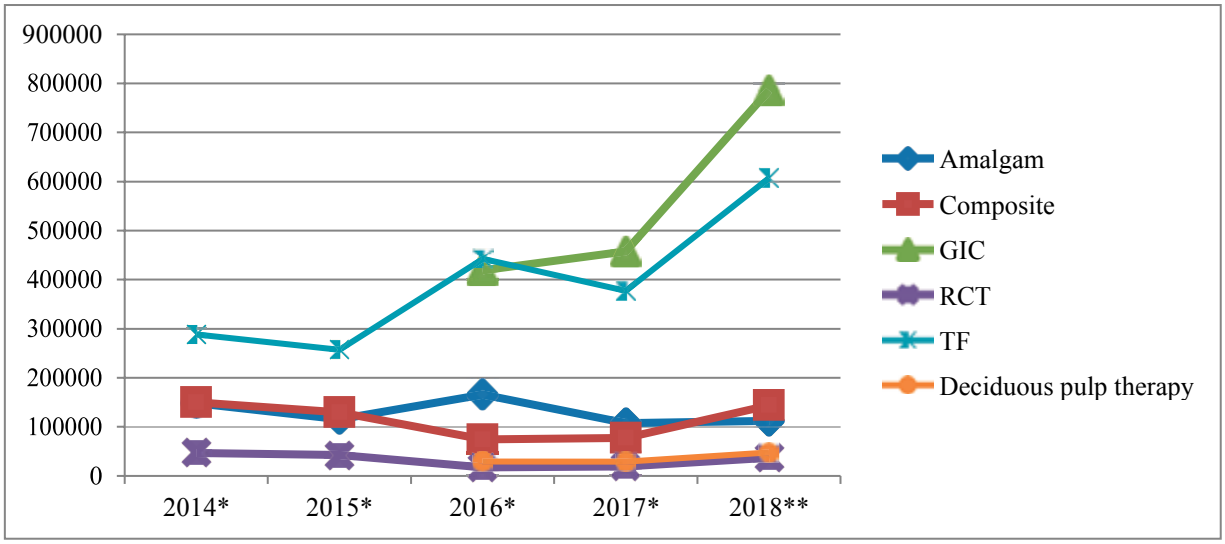


** Data from Annual Health Bulletin*
*** Data from Regional Dental Surgeons in hospitals under provincial council and directly from dental surgeons in hospitals under the line ministry*

There were 3,744,466 patients attended to government dental clinics during 2018. This figure has increased from 1,758,883 patients in 2014 (Annual Health Bulletin 2014). The number of extractions done has increased from 597,095 in 2014 to 1,053,428 in 2018. The number of restorations done has increased from 587,287 in 2014 to 1,649,386 in 2018. The number of scalings done has increased from 85,090 in 2014 to 234,757 in 2018.

(Annual figures cannot be compared since up to 2017 the figures were from passive surveillance and 2018 figures were from active surveillance)

Fig. 4.25: Performance of dental surgeons according to types of tooth fillings from 2014 to 2018



** Data from Annual Health Bulletin*
*** Data from Regional Dental Surgeons in hospitals under provincial council and directly from dental surgeons in hospitals under the line ministry*

According to the available data, the number of composite and amalgam fillings, root canal treatment and deciduous pulp therapy done has not changed much from 2014 to 2018. But there was a marked increase in the number of GIC fillings and temporary fillings done.

(Annual figures cannot be compared since up to 2017 the figures were from passive surveillance and 2018 figures were from active surveillance)

Chapter 5

Public Oral Health Services

Dental public health is defined by the American Board of Dental Public Health as: the science and art of preventing and controlling oral diseases and promoting oral health through organized community efforts. Moreover, it is a philosophy to promote general health and well-being of people by promoting their oral health status. It is the form of dental practice which serves the community, as a patient rather than focusing on an individual.

Oral diseases constitute an important public health problem in Sri Lanka. The reasons for their importance in this context are; high prevalence, public demand for care, and their impact on quality of life of individuals and society in terms of pain, discomfort, social and functional limitations as well as handicap. The financial impact of oral diseases on individual and community is very high. However, an important feature of oral diseases is that they are preventable and controllable if appropriate and timely interventions are carried out. There are well proven, cost effective strategies for prevention and control of oral diseases.

For the 21.6 million population (estimated-mid-year population 2018: Department of Census and Statistics,2019) of Sri Lanka oral health is an important concern. There are evidences for changing oral disease patterns, trends and demographic, epidemiologic and economic transitions in Sri Lanka. There are advancements and improvements in management techniques in oral diseases. Addressing oral health issues is crucial to be incorporated into oral healthcare services and there is wider consensus for effectiveness and efficiency in managing oral diseases by integrated approach.

The preventive oral health services came to operation in 1953 with the establishment of the school dental services manned by school dental nurses. The post of school dental nurse was changed later as school dental therapist. In 1970's, Regional Dental Surgeon posts were created and they were the managers of oral healthcare services at district level. At present

RDSs are responsible for planning, implementation and evaluation of oral healthcare programmes and promotion of oral health in the division.

In 1991, dental public health postgraduate courses leading to MSc and MD were started by the Post Graduate Institute of Medicine. Since these programmes are integrated with similar programmes in Community Medicine, the trainees are getting exposed not only to dental public health but also to a wide range of subjects on general public health. Specialists in Dental Public Health having MD in Community Dentistry are appointed at main focal points of public health services at national level and at provincial level.

Apart from the work carried out by the specialists, Dental Public Health is provided through School Dental Service manned by SDT and through Adolescent Dental Clinics and Community Dental Clinics which are manned by Dental Surgeons. School Dental Service provides need based preventive care services to children. Moreover, Ministry of Health has appointed Community Dental Surgeons to MOH divisions to provide preventive oriented services at MOH level.

Specialists in Dental Public Health are appointed to the following centers of the Ministry of Health:

1. Oral Health Promotion Unit - Health Promotion Bureau
2. Oral Health Unit - Family Health Bureau
3. Oral Cancer Prevention and Control Unit - National Cancer Control Programme
4. Oral health Unit- National Institute of Health Sciences
5. Preventive Oral Health Units - National Dental Hospital (Teaching) and Institute of Oral Health, Maharagama
6. Research and Surveillance Unit - Institute of Oral Health, Maharagama
7. Training Unit - Institute of Oral Health, Maharagama
8. Oral Health Unit - Office of Provincial Director of Health Services-Western province
9. Oral Health Unit - Office of Provincial Director of Health Services-Sabaragamuwa province

5.1 Oral Health Promotion Unit - Health Promotion Bureau

Keeping in line with the goal of Health Promotion Bureau (HPB), the goal of oral health promotion unit is 'Improved oral health and oral wellbeing of the country, while addressing oral health inequalities and social determinants of oral health'. The unit carries out activities on following overall strategies identified by the HPB:

- Providing advocacy for Oral Health Promotion on identified oral health issues
- Creating enabling environment for Oral Health Promotion: Promotion of oral health in all 5 settings developed/ proposed by the HPB: Village, pre-school, school, hospital and workplace. The 'pre-school health promotion setting development guidelines' and all related activities on pre-school health promotion setting development are coordinated by the Oral Health Promotion Unit.
- Mediating to establish collaborative work for Health Promotion: Collaborative work with other preventive programmes and clinical sub-specialties in dentistry; Collaborate in activities on policy and guideline development related to oral health.
- Communication: In order to reduce risk factors and risk behaviours of individuals and communities,
    - conduct in-service training for oral healthcare staff related to communication and counseling skills;
    - Contribute to in-service training for primary healthcare staff on oral health promotion;
    - Development of Information, Education & Communication (IEC) material; Conduct media seminars/ conferences in the field of oral health;
    - Conduct awareness programmes for general public on novel facts and current oral health activities;
    - Contribute to 24-hour health information on-call service 'Suwasariya': provide clarifications for oral health related queries;
    - Development of communication strategies and packages on oral health; Undergraduate and post-graduate teaching and training
- Monitoring and Evaluation of oral health promotional activities at national, provincial and district levels through health promotion returns (eHEAPIMS).
- Conducting operational research on oral health

With the re-launching of earlier Health Education Bureau as Health Promotion Bureau in the year 2017, to contribute to the National Health Promotion Programme, the Oral Health Promotion Unit carries out activities according to a Results Based Framework and Key Performance Indicators identified. The unit is working on the three simple and cost-effective oral health promotional strategies: Brushing, Check-up, Diet to address common oral diseases and to uplift the Sri Lankan smile.

5.2 Oral Health Unit - Family Health Bureau

The main objective of the Oral Health Unit of the Family Health Bureau is promoting oral health of mothers and children (0-18years) and thereby promoting oral health of the family through existing Maternal and Child Health (MCH) programme, thus achieving sustainable oral health improvements and quality of life of Sri Lankan population".

The unit covers following areas:

- Monitoring & evaluation of existing School Dental Services and the MCH component of Community Dental Services.
- Developing guidelines and advocating on oral health policy formulation in relation to oral health of pregnant mothers and children
- Conducting in-service training for relevant staff
- Providing technical expertise for planning and implementation of oral health of promotion programmes for pregnant mothers and children.

5.3 Oral Cancer Prevention and Control Unit – National Cancer Control Programme

Oral cancer is the second most common cancer among Sri Lankan population and the leading cancer among males. Nearly 2000 new oral cancer cases (lip, tongue and mouth cancers) were detected in the year 2011 (Cancer Incidence Data 2011). Every day around 6 new oral cancer cases are being detected and 3 oral cancer related deaths occur. The common risk factors for oral cancer are use of tobacco (smoking & smokeless), areca nut and consumption of alcohol. Infections such as Human papilloma virus and candida are less common risk factors. Additionally poor oral hygiene and chronic dental trauma (sharp edged roots) are questionable risk factors. However, there is emerging evidence on elevated risk of oral cancer associated with high periodontal diseases burden among oral cancer patients. Poor oral hygiene is interlinked to the periodontal disease status.

The Oral Cancer Prevention and Control Unit of the National Cancer Control Programme headed by a consultant in Community Dentistry, is responsible for oral cancer prevention, early detection and improving diagnostic services in Sri Lanka. The functions of the unit have been integrated with all cancer related activities conducted by the National Cancer Control Programme.

The key activities of the unit are:

- Developing national strategic framework, legislations and action plans in relation to prevention and control of oral cancer.
- Conducting advocacy programmes for different partners related to oral cancer and capacity building programmes for healthcare staff at various levels.
- Providing logistic support in terms of development and printing of guidelines, reports recording formats and IEC materials pertaining to oral cancer prevention control and play a supplementary role in the provision of equipment pertaining to diagnosis, early detection and treatment of oral cancer.
- Conducting and facilitating media related activities and public awareness programmes pertaining to prevention and control of oral cancers.
- Maintaining information system and surveillance to monitor the progress and to evaluate the outcomes of oral cancer prevention and control activities

5.4 National Institute of Health Sciences

The Oral Health Unit of the National Institute of Health Sciences is placed under the Public Health Field Services of NIHS, executing public health functions in both Training Faculty and the Field Services.

The oral health unit of the NIHS signifies special functions in 4 training departments of the Training Faculty (Department of Public Health Training/ Department of Management/ Department of Research/ Department of Educational Sciences) and the Public Health Field Services. The oral health component of all basic, post-basic, in-service and international trainings are carried out by the Consultant in Community Dentistry in this unit. It includes the MSc and MD postgraduate training for Community Medicine/ Community Dentistry of the Postgraduate Institute of Medicine, Sri Lanka and other national and international postgraduate training institutions. Oral health unit itself coordinates continuing education programmes for primary healthcare staff, other relevant categories of health staff and 'non- health' sector staff with a view to optimize the multidisciplinary approach to oral health. Oral health unit also facilitates the research programmes of the NIHS to foster a culture of local and international collaborative research on oral health. It further contributes to the revision of training curricula of public health staff and improves the trainer/ examiner capacities in oral health.

The NIHS is very unique in possessing its own field training area namely two MOH areas – Kalutara and Beruwala. Oral Health Unit continues to support all the public health field training programmes and the oral health research carried out in the field. All public health trainees can gain experience in community based oral healthcare during their field training. Oral Health Unit facilitates all primary healthcare services delivered to the community in the field practice area with special emphasis on oral health promotion. It works collaboratively with the Community Support Center / Mental health Unit of NIHS in delivering counselling services for tobacco and areca nut cessation. All community and adolescent dental services under NIHS field practice area specifically comply with service needs of the National Public Oral Health Programme.

5.5 Preventive Oral Health Units

Preventive Oral Health Units (POHU) denotes specialized units in the specialty of Community Dentistry (Dental Public Health). There are two such units in tertiary care public dental hospitals namely POHU at the National Dental Hospital (Teaching) Sri Lanka and POHU at Institute of Oral Health, Maharagama. These units provide a unique model of oral healthcare provision underpinned by oral health promotion and oral disease prevention. POHU conducts preventive dental clinics to provide clinical preventive dental procedures combined with oral hygiene improvement and dietary counseling as well as conducting community-based and outreach oral health programmes. The latter oral health programmes are targeted predominantly to preschool children and pregnant mothers attending selected preschools and antenatal clinics respectively. In general, preschool children and pregnant mothers comprised of priority groups who carry a high burden of oral disease. Oral health awareness for parental care givers and pregnant mothers and screening for oral diseases and referral for oral healthcare are essential service provision elements of community-based and outreach programmes. These units specifically comply with service needs of National Oral Health Programme for pregnant mothers.

While providing cost-effective clinical preventive oral healthcare for toddlers, preschool children and school children, it is aimed to make high caries risk children to low caries risk and to sustain it into adulthood. The preventive and promotive oral healthcare package consists of behavioural management of toddlers and children, dietary counseling, oral hygiene improvement, fluoride varnish application, fluoride gel application, fissure sealant application, Glass Ionomer Cement restorations and follow up of care. Hence, service delivery model of POHU demonstrate high risk approach, life-cycle approach and practice of all levels of prevention namely primodial, primary, secondary and tertiary by combining communities to preventive dental clinics. These units provide continuous updates of technical inputs for the policies and evidence-based, self-sustainable, best practice models of clinical preventive dental care provision.

Despite commonalities in core service provision POHU, NDHTSL caters to oral health improvement needs of children and adults referred by other specialized units and outpatient dental clinics and conduct outreach oral health programmes for diabetic patients attending

selected diabetic clinics at National Hospital Sri Lance (NHSL) while referring them for oral healthcare.

5.6 Research and Surveillance Division - Institute of Oral Health, Maharagama

Research and surveillance division of dental services, which is headed by a Consultant in Community Dentistry, is located at the Institute of Oral Health, Maharagama.

This division is responsible for:

- Promoting and conducting national level researches pertaining to oral health including National Oral Health Survey which are important for national level planning in oral health.
- Maintaining acceptable quantity, quality, and standards in research pertaining to oral health carried out within the country.
- Developing and maintaining a quality and accurate surveillance system for oral health in Sri Lanka.
- Analyzing the research carried out in the country and to provide timely and accurate information to the administrators to improve the oral health services of Sri Lanka.
- Encouraging research in the field of oral health by providing necessary information, technical support for the researchers and assist in exploring research potentials.
- Liaising with other organizations in promoting oral health research.

5.7 Training Division - Institute of Oral Health, Maharagama

The training division of the dental service established in 2011 and is located at the Institute of Oral Health Maharagama and headed by a Consultant in Community Dentistry. The unit provides training for the following categories of staff.

- **Entry level recruitment/ Orientation training**

Newly appointed dental surgeons and other oral healthcare personnel assigned to the oral health service of Sri Lanka are given orientation training

- **In-service technical competency development training**

Training division is responsible for provision of sufficient in-service training for all categories of oral health human resources in order to enhance their knowledge, skills and attitude. Hands-on training programmes are conducted whenever possible in order to improve the quality of training. These types of training programmes are organized to improve the productivity and quality of care provided by the employees. It is the responsibility of the training division to develop course modules and to liaise with other external agencies in providing in-service training programme.

- **Continuing dental education for dental professionals**

Training division is planning to organize continuing dental education programmes for dental professionals including consultant dental surgeons with the collaboration of local and international experts to enhance their knowledge on technology and techniques to be in par with the international standards.

5.8 Oral Health Unit - Office of Provincial Director of Health Services

Provincial Consultants in Community Dentistry (PCCDs) are appointed at provincial level in order to improve oral health within the province and to coordinate provincial level activities related to oral health with the central level and various governmental and non-governmental organizations (NGO) through Provincial Director of Health Services (PDHS).

The PCCD is responsible for:

- Gathering oral health information from district level and coordinating the activities of RDS with the provincial authorities.
- Collecting and compiling of district data and providing a feedback to the district level to improve oral health at provincial level.
- Organizing quarterly review meetings headed by PDHS with the participation of Regional Director of Health Services (RDHS), RDSs and SSDTs of all the districts in the province.
- Improving the knowledge and skills of the health staff, to be the change agents in inculcating good oral health behaviors of the community and to obtaining their support as volunteers where necessary.
- Developing provincial policies/ strategies as well as monitoring implementation of these policies to promote the oral health of the general community and priority groups and to improve the quality and safety of the services provided.
- Coordinating a well-organized oral health screening program ensuring a proper referral system within the province
- Promoting and conducting provincial level research pertaining to oral health and to provide timely and accurate information to provincial and national level authorities for planning of oral health service.
- Encouraging research in the field of oral health by providing necessary information, technical support for the researchers and assisting in exploring research potentials.
- Maintenance of a database of manpower, equipment and material.

5.9 School Dental Service in Sri Lanka

In the early stages of school dental services, the performance of the dental nurses was supervised by dental surgeons. Subsequent to increasing number of school dental clinics and adolescent dental clinics, supervising school dental surgeons were appointed to each of the health divisions. The post of supervising school dental surgeon was later converted as Regional Dental Surgeon and the dental nurses are currently named as School Dental Therapists. Supervising School Dental Therapists are appointed to health districts to oversee the work of SDT and to support the supervision of the RDSs.

School Dental Therapists

A school dental therapist is supposed to perform primary & secondary preventive activities for children between 3 to13 years of age and to conduct oral health promotional activities in the community. She is responsible for creating oral health awareness among all members of the community with special emphasis for prevention of dental caries and periodontal disease. She should take the leading role in the primary healthcare team with regard to discharge of duties in relation to preventive & promotive oral healthcare delivery.

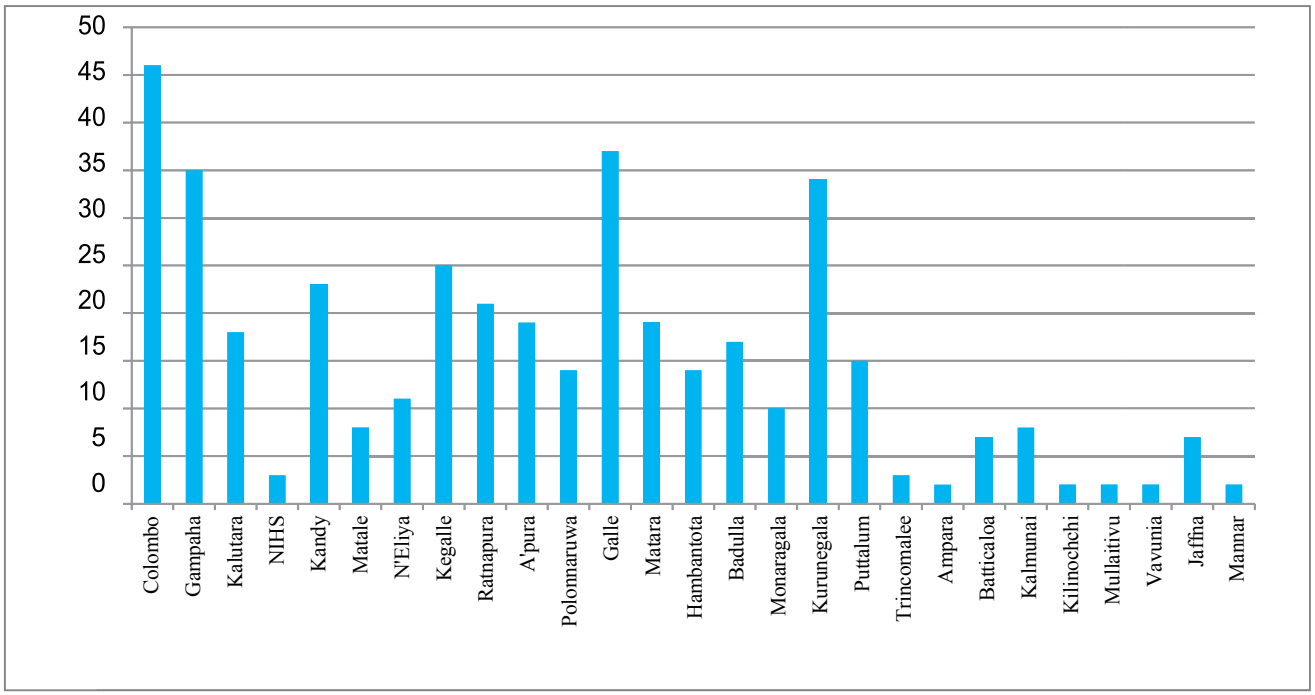
School dental therapists should visit the schools and preschools allocated to her and screen and provide comprehensive oral healthcare within the scope of SDT. A school dental therapist should provide comprehensive oral healthcare to a minimum of 2000 school children in the target group and 500 preschool aged children annually. In addition, it is her duty to provide treatment on demand to children on a casual basis. Whenever possible the SDT should participate in School Medical Inspections. In schools with a student population over 200, screening and provision of oral healthcare should be carried out annually for children in Grades 1, 4 and 7. In schools with a student population less than 200, this should be carried out annually for all children below 13 years of age.

As a member of the primary healthcare team, SDT is supposed to promote preventive oral healthcare activities to children less than 3 years. She should also assist the dental surgeon attached to office of MOH and dental Surgeon in ADC/CDC in oral health promotional activities.

All patients in need of treatment, beyond the scope of the School Dental Therapist should be referred to the appropriate treatment center.
School Dental Therapists should always be in full uniform when on duty, and will ensure that her appearance is smart. Working hours of SDT are either 8.00 am to 3.00 pm or 8.30am to 3.30 pm on week days and 8.30 am to 12 noon on Saturday. She needs to maintain updated inventories, registers, returns and records. Supervision of SDT should be carried out 4 times by Supervising School Dental Therapist, 4 times by MOH and 2 times by Regional Dental Surgeon annually.

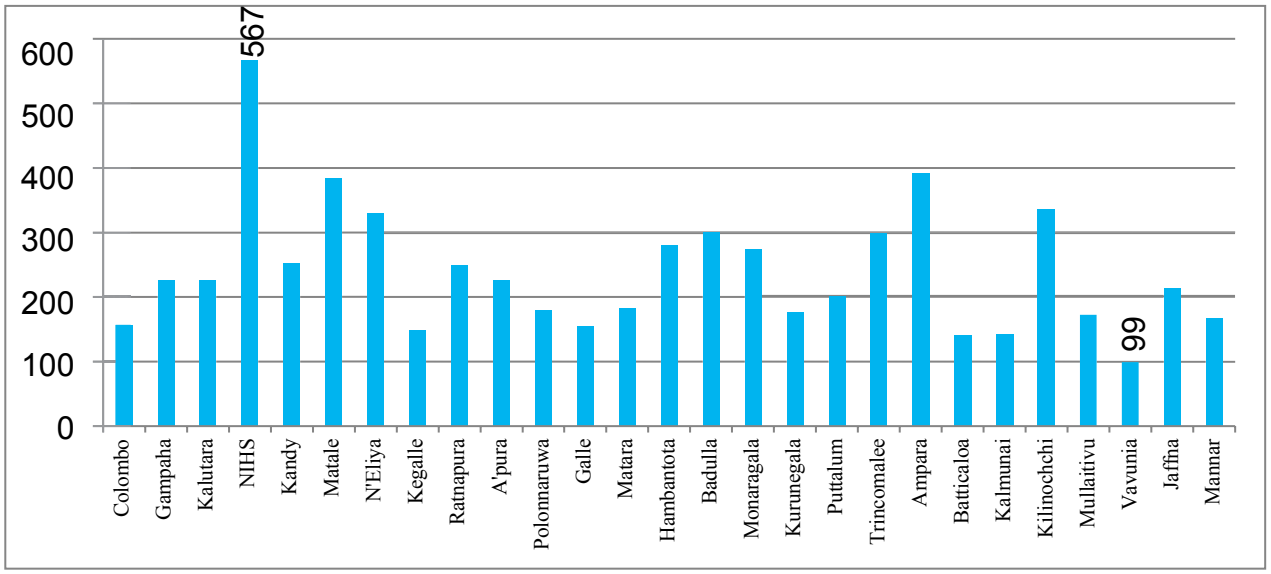
In conclusion, Sri Lanka as a lower middle-income-developing country possesses a vibrant Dental Public Health Service with a consortium of units integrated into the existing public healthcare delivery model. However, they need advocacy and performance appraisal in order to harness their full potential to reduce the oral disease burden in the country.

Fig. 5.1: Distribution of SDTs in Sri Lanka (End of 2018)



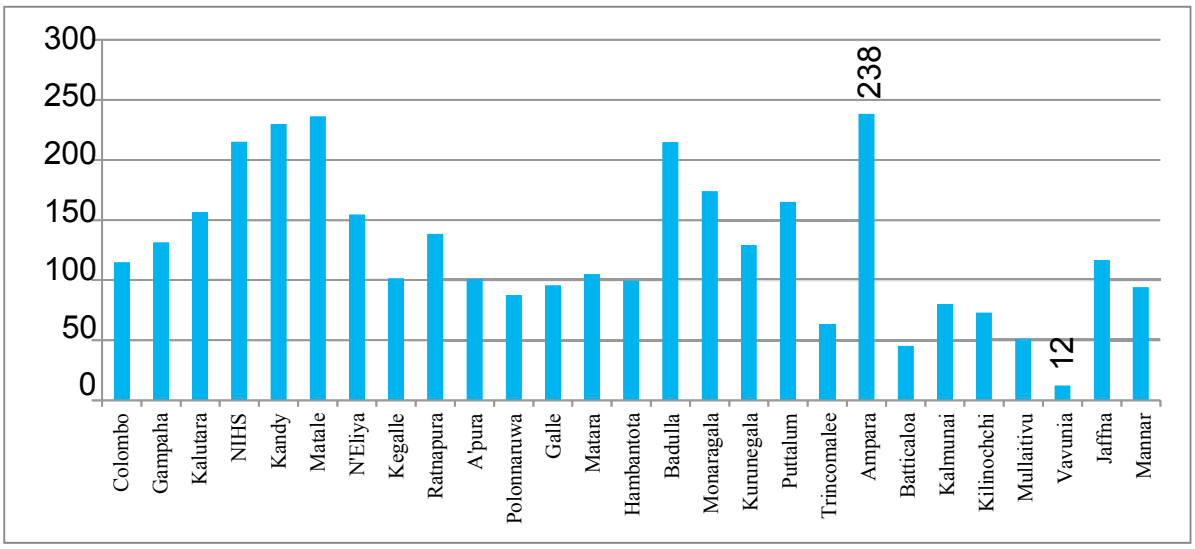
There were 369 school dental therapists working in 422 school dental clinics in Sri Lanka at the end of 2018. These SDTs were working under the provincial council. Distribution of SDTs within the country shows a pattern of maldistribution. Majority of SDTs were working in Colombo and Galle districts, followed by Gampaha and Kurunegala.

Fig. 5.2: Number of children screened by one SDT during a month in year 2018



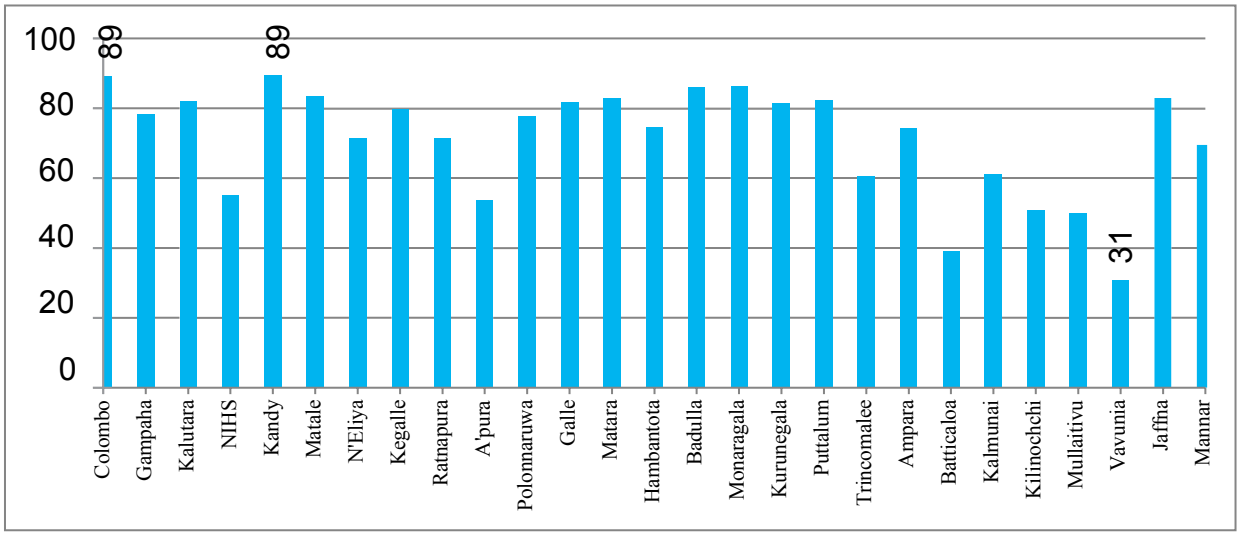
On average a school dental therapist had screened 213 school children during a month in the year 2018. The highest number of screening of children (567 per SDT per month) was done in the area under NIHS and the lowest was reported from Vavuniya district (99 per SDT per month).

Fig. 5.3: Number of children treated by one SDT during a month in year 2018



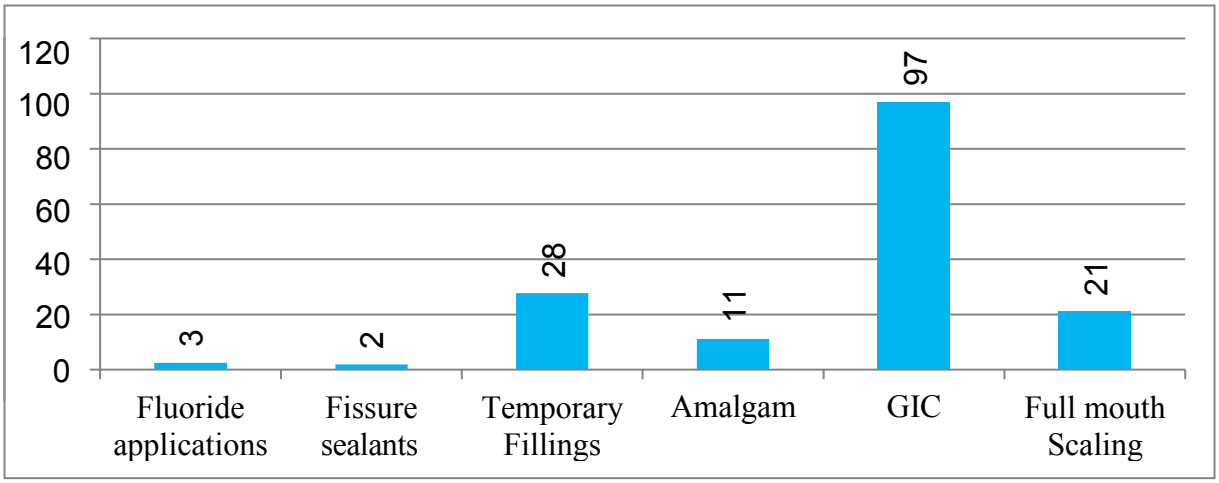
On average a school dental therapist had treated 131 school children during a month in the year 2018. The highest number of children treated (238 per SDT per month) was from the district of Ampara and the lowest was reported from Vavuniya district (12 per SDT per month).

Fig. 5.4: Percentage of children treated by SDT, out of those who are having oral health problems during year 2018



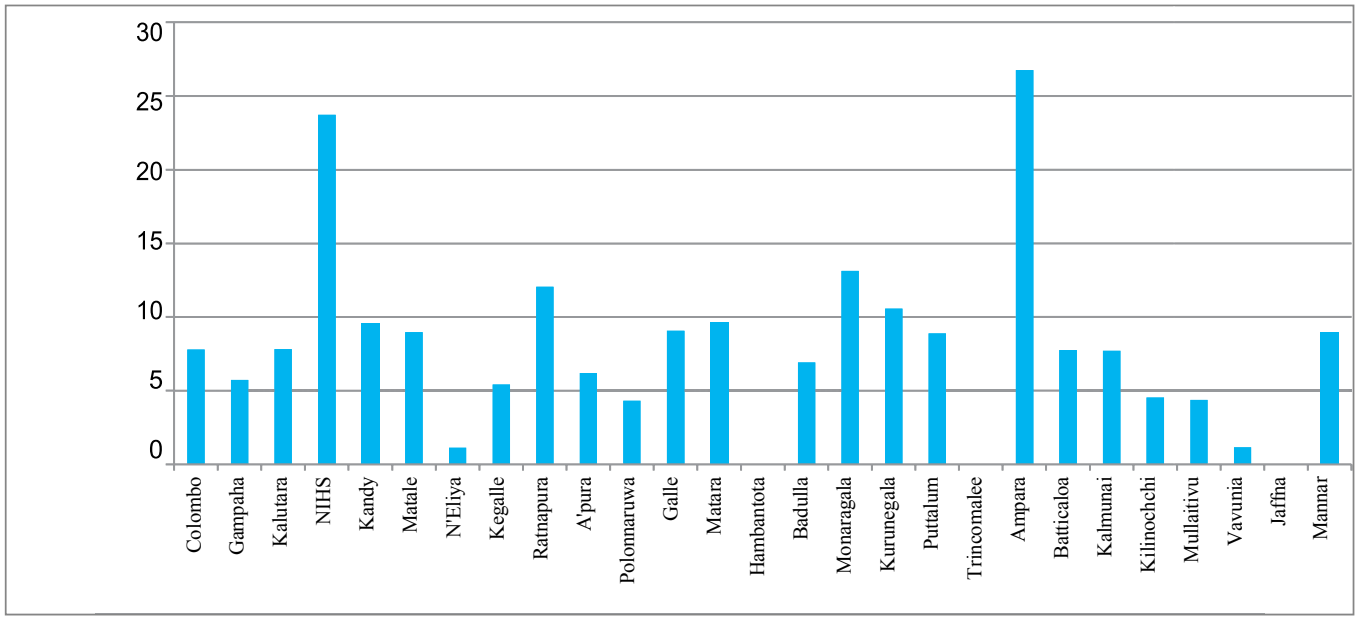
On average out of those who are having oral health problems, 79% of children were treated during the year 2018. The highest percentage was reported from Colombo and Kandy districts (89%). The lowest was reported from Vavuniya district (31%).

Fig. 5.5: Number of treatments done by one SDT during a month in year 2018



On average one SDT had placed 97 glass ionomer cement fillings and 11 amalgam fillings during a month in the year 2018. The number of temporary fillings done was 28, while the number of scalings done was 21.

Fig.5.6: Number of oral health promotional sessions conducted by one SDT during a month to different target groups in year 2018



The highest number of oral health promotional sessions conducted by one SDT during a month was in Ampara district. Conducting oral health promotional session was not reported from the districts of Hambantota, Tricomalee and Jaffna.

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