

A Framework for Equity Access to Primary Dental Care

Equidade de Acesso à Atenção Básica em Saúde Bucal

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Abstract *The objective of this study was to demonstrate face validity with a novel resource allocation framework designed to maximize equity into dental booking systems. The study was carried out in 2014. Eleven experts in primary dental care practice in Southern Brazil participated, using a three-round consensus group technique. First, the experts reached consensus on the items to be included in a 5-level diagnostic scale. They identified 21 clinical conditions and categorized them according to the oral health intervention required. Then, they described workload and activity standards for dental staff to carry out health promotion, oral disease prevention, dental treatment, dental rehabilitation, and urgent dental care. Finally, they agreed upon a set of wait times for primary dental care, establishing maximum waits from 2 to 365 days, according to the diagnostic classification. The framework demonstrated potential ability to promote more equitable access to primary dental services, since equal diagnostic classifications share the same waiting times for the dental care they require.*

Key words *Health Equity, Health Resource Allocation, Oral health*

Resumo *O objetivo do estudo foi demonstrar validade de face com uma nova matriz destinada a maximizar a equidade nos sistemas de agendamento odontológico. O estudo foi realizado em 2014, no qual participaram 11 dentistas com experiência de trabalho na rede básica de saúde da região sul do Brasil, utilizando a técnica de grupo de consenso em três rodadas de discussão. Primeiro, os participantes chegaram ao consenso quanto aos itens que deveriam estar presentes em uma escala de classificação diagnóstica de 5 níveis. Identificaram 21 condições clínicas de saúde bucal e as categorizaram conforme a intervenção necessária. A seguir, os participantes descreveram as cargas de trabalho e os padrões de atividade recomendados para a equipe odontológica realizar promoção da saúde, prevenção de doenças bucais, tratamento odontológico, reabilitação dentária, e atendimento odontológico de urgência. Por último, os dentistas chegaram ao consenso sobre tempos máximos de espera para atendimento odontológico na rede básica, estabelecendo prazos de 2 até 365 dias conforme a classificação diagnóstica atribuída. Este estudo demonstrou o potencial da matriz de alocação de recursos para promover acesso mais equitativo aos serviços odontológicos da rede básica, uma vez que classificações diagnósticas iguais compartilham os mesmos prazos de espera para o atendimento odontológico requerido.*

Palavras-chave *Equidade em Saúde, Alocação de Recursos em Saúde, Saúde Bucal*

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Introduction

Timely provision of health care has received much attention from public health policy makers and this has stimulated a range of studies related to the management of waiting lists for access to health services¹⁻³. For the last decade, countries such as Canada and Australia, among others, have made huge efforts to work towards evidence-based benchmarks for medically acceptable waiting times^{4,5}. However, research on waiting lists has been largely limited to non-urgent, inpatient and outpatient specialist services, with little attention being paid to waiting lists for access to primary health care.

In Brazil, wait time for public health services is a public concern. In response, the Supreme Court has called for a nationwide debate among health professionals and health authorities regarding the responsibility of the public health system in providing timely access to hospital and specialized medical care⁶.

For the purpose of this study the definition for equity access is "equal access to health care for those in equal need"⁷. The Brazilian Family Health Programme has played a strategic role in tackling access inequities to primary health services, including dental services. Federal funds have been provided to municipal governments to expand primary health service coverage in poor areas, thereby improving access to health care. Despite significant achievements in child survival^{8,9}, little is known about the balance between human resource capacity in the programme and the demand for services placed on it. No official waiting time figures have been routinely collected at local or national programme levels and it is still uncertain how the programme is affecting equity of access within and between local clinic catchment areas.

Evidence-based wait time benchmarks are crucial to equity of access to healthcare services¹⁰, including dental care¹¹. Standardized frameworks for equitable allocation of resources to primary dental care services may support more timely access to dental care. However, frameworks specifically tailored for primary dental care settings based on equity access were not found in the literature.

The objective of this study was to demonstrate face validity with a novel dental resource allocation framework, designed to maximize equity into dental booking systems at the primary health care level. The framework provides waiting time benchmarks for primary dental services needed by people living within local clinics catchment areas.

Method

Since no previous study on this kind of framework has been found, face validity was selected as the most appropriate way to test it. By using consensus group technique, in which participants negotiate and decide the findings¹², the criteria for the framework components were defined and validated. In 2014, eleven dentists with experience and expertise at the primary dental care level, working in public primary health care clinics located in the metropolitan area of Porto Alegre, Brazil took part in the study. The participants' main task was to assess whether "on its face" the proposed framework could be used to allocate human resources for equitable access to primary dental care.

The consensus process was carried out in three working group sessions. In the first session, the proposed framework was presented to the group so that dentists develop an understanding on the concept of equity adopted in this study. Participants were made familiar with the procedures and the scope of their task. They start by setting the minimum level of consensus in 2/3 of the judgments. The participants received detailed explanations of the three dimensions of the framework depicted in Chart 1: i. A 5-level diagnostic scale; ii. The primary care intervention streams, which, according to the guidelines of the Brazilian Oral Health Policy¹³, are: health promotion, dental disease prevention, dental treatment and dental rehabilitation besides urgent care and surveillance; iii. A maximum wait time matrix for primary dental care for each intervention stream and diagnostic rank.

At the end of the first section, participants were asked to revise the diagnostic scale to include every clinical condition usually presented at the primary care level.

In the second section, dentists consulted the official Brazilian Occupational Code published by the Ministry of Health¹⁴ to identify the workload components in primary dental care, listing activities and procedures for each dental staff category. The next task was to set an activity standard for each component of daily workload, establishing the average time taken by:

- a dentist to perform actions in a quadrant eligible for rehabilitative procedures;
- a dental hygienist to perform actions in a quadrant eligible for curative procedures;
- a dental hygienist to perform activities for a group of patients eligible for preventive care;

Chart 1. General structure of the dental resource allocation framework presented to the experts for validation.

Categorize clinical status of the dental quadrant	Rank	Intervention streams					
		Health promotion	Disease prevention	Dental treatment	Oral rehabilitation	Dental Recall	Urgent Care
Set maximum waiting times (in days)							
Conditions requiring urgent care	5						
Severe loss of hard tissue or severe dysfunction/disability or a condition preventing the commence/progress of a medical treatment	4						
Moderate loss of dental hard tissue or moderate dysfunction/disability	3						
Minimal loss of dental hard tissue or minimal dental dysfunction/disability	2						
Healthy conditions	1						

- a community health worker to perform activities for a community or a family group eligible for health promotion.

Activity standards were defined according to the WISN method¹⁵ as the average time it would take a trained and well-motivated staff member to perform the actions/procedures to an acceptable standard of practice, provided that required equipment/materials are available.

In the third section, participants assigned each clinical condition to an intervention stream, namely: health promotion, oral disease prevention, dental treatment, dental rehabilitation, and urgent dental care, determining maximum intervals (in days) between dental visits in which classified dental quadrants would remain free of clinical deterioration.

Ethical considerations

The study was submitted to the Senate Research Ethics Committee of the Faculty Dentistry, University of Western Cape, South Africa, and to the Research Committee of the Institute of Education and Research of the Moinhos de Vento Hospital, Porto Alegre, Brazil, getting approval in both committees in 2013.

Results

Eleven dentists effectively participated in the study, achieving 100% of consensus for face va-

lidity of the three components of the dental resource allocation framework.

Chart 2 presents the validated diagnostic ranking criteria for the 21 oral clinical conditions usually seen by dentists at the primary care level. The clinical conditions were assigned to each stream of care, according to the need of primary dental care.

Chart 3 shows the validated workload components by staff type and intervention stream. Although dental auxiliaries are part of the dental team, their workload was not included because their main work is not direct to patient care clinic, but to assisting dentists and dental hygienists.

Table 1 shows the validated procedure and activity standards. The results of Table 1 demonstrate consultation timings for procedures carried out by dentists and dental hygienists in a classified dental quadrant. Timings for group activities were defined for a regime of preventive care and health promotion performed by dental hygienists and community health workers, respectively.

Table 2 shows the set of validated maximum lengths of time expected for a classified quadrant to remain free of clinical deterioration, while going through the required dental care pathways.

Discussion

By face validity, a preliminary validation stage of the framework was accomplished. Face validity is sufficient evidence for newly developed tools/

Chart 2. Diagnostic classification criteria.

Rank	Description
5	1. Pain or discomfort of any intensity originating in the oral cavity, spontaneously reported by the examinee
	2. Change in colour/shape of soft tissue, including trauma, bleeding, edema, etc.
4	3. Anterior cross bite should be registered in the upper quadrant of the affected side, only if the second permanent molar is absent
	4. Severe loss of hard dental tissue, involving more than half of a posterior tooth crown or reaching the contact surface of anterior tooth
	5. Intra or extra-oral fistula
	6. Severe dental mobility of a permanent tooth
	7. Residual tooth root
	8. Plaque retentive iatrogenic factors
	9. Retention of the homologous tooth, when the timing and/or sequence of tooth eruption is altered
	10. Need of tooth extraction for orthodontic reasons
3	11. Moderate loss of dental hard tissue, involving more than half of either the posterior tooth crown or the incisal edge of anterior tooth
	12. Provisional sealing
	13. Dental calculus (present in any amount)
	14. Moderate dental mobility of permanent tooth
	15. Anterior open bite in the deciduous dentition
2	16. Minimal loss dental hard tissue, involving only fissure area or small smooth surface, or reaching less than half of incisal edge of anterior teeth
	17. Mature dental plaque
	18. Emerged deciduous or permanent teeth in eruption process
1	19. Restored teeth
	20. Sound and fully erupted teeth; teeth with normal anatomical details resulted from controlled cavities, abduction, retraction, abrasion or fractures
	21. Perioral skin and oral mucosa with normal consistency, colour and keratinization pattern

Chart 3. Dental staff for each intervention stream and the respective workload components.

Intervention stream	Dental staff	Workload components
Health promotion	Community Health Worker	home visit, education activity in the community or at homes, toothbrush training groups
Disease prevention	Dental Hygienist	fluoride therapy for school groups or community groups
Curative procedures	Dental Hygienist	home assistance, application of cariostatic agents, teeth scaling, cleanings and polishing (prophylaxis), application of dental sealants
Operative dentistry, Oral rehabilitation and Urgent care	Dentist	home visit for rehabilitation, tooth fillings, periodontal scaling and root planning, tooth extractions, restoration; pulpectomy, frenectomy, abscess drainage, pulpotomy, installation of dental prosthesis, shaping of dental prosthesis

methods that are to be implemented in further evaluative settings¹⁶, and provides theoretical basis for future validity studies¹⁷. The study gathered relevant professional experts who reflect the typical dental practice performed in primary health care contexts. This offered a profession-

ally driven approach to establishing the criteria, enhancing professionals' accountability into the validation process.

Consensus technique was applied for estimating wait times by diagnoses. This technique requires the presence of a previous underlying

Table 1. Procedure and activity times for dental care of people assigned to primary health care facilities.

Health personnel	Diagnostic rank	Time (min) for procedures per quadrant	Time (hours) for activities per group of people
Dentist	5	30	n/a
	4	60	n/a
	3	30	n/a
	2	15	n/a
	1	10	n/a
Dental Hygienist	4	n/a	2 (groups of 8)
	3	45	3 (groups of 10)
	2	n/a	4 (groups of 12)
Community Health Worker	1	n/a	2 (groups of 4)

Note: n/a (not applicable).

Table 2. Validated set of wait time benchmarks (in days) for access to intervention streams.

Diagnostic rank	Health promotion	Disease prevention	Dental treatment	Oral Rehabilitation	Dental Check-up	Urgent Care
	CHW ^a	DHG ^b	DHG ^b	Dentist	Dentist	Dentist
5	n/a	n/a	n/a	n/a	n/a	2
4	n/a	2	n/a	60	n/a	n/a
3	2	60	120	180	n/a	n/a
2	30	90	180	365	n/a	n/a
1	60	n/a	n/a	n/a	365	n/a

^aCommunity Health Worker; ^bDental Hygienist; n/a (not applicable).

agreement¹². Hence, the experts agreed on validating the framework upon the definition of equity access adopted in this study⁷: “equal access to primary dental care for those in equal need”.

It is important to acknowledge the exploratory nature of this research. By documenting a first-hand evaluation of such kind of framework, the results of this study preclude comparisons with other findings. However, some of the results regarding wait times for urgent dental care and dental reviews can be generally compared to what has been adopted elsewhere. In Queensland, Australia, for example, the Health Department in consultation with senior public health dentists has established waiting times for general dental treatment, dental review and for referral services¹⁸. They defined that dental treatment is desirable within 1 month for a dental condition that has the potential to deteriorate quickly to the point that it may become a medical emergency and within 3 months for a dental condition that

is causing some pain. In our results, for similar conditions the maximum waiting time for a dental visit was set in 2 days. Furthermore, the experts from Queensland defined that check-ups are desirable within 2 years, while in this study dental reviews are to be within 1 year. It is important to highlight that in Queensland, the public health system has an open-data policy and the system aims to provide access to at least 90% of patients within the established wait times¹⁹. However, no information was found about the probability of clinical deterioration among those patients in Australia who are waiting within the established times. Regarding recall intervals, the National Institute for Health Care Excellence (NICE) recommends that intervals be determined according to each person's needs, and they may vary over time between 3 and 12 months for children and adolescents and between 3 and 24 months for adults and elderly²⁰. On the other hand, a review of randomized controlled trials

carried out by the Cochrane Oral Health Group found insufficient evidence to determine both optimal interval for dental check-ups and beneficial/harmful effects of altering the recall interval between dental check-ups²¹.

The criteria for the diagnostic scale validated in this study seem to be aligned with the recommendations made by Summerton²². This author argues that general practitioners must be assisted in their diagnostic decisions concerning the unselected nature of communities seeking healthcare at the primary care level and that early decisions on the appropriate course of action at the primary care level are more important than accurate diagnostic labels made by specialists²². The proposed diagnostic scale intends to be a simpler and less costly instrument for routine assessment of the dental status, in contrast to protocols for detailed visual-tactile and resource-intensive oral examinations, with multiple data fields. Moreover, it is expected that non-dental decision makers and laypersons can easily understand the diagnostic classifications results. Because disease prevalence is highly influenced by the kind of instrument adopted²³, the proposed diagnostic tool must be further tested against findings of comprehensive visual-tactile oral examinations in order to determine validity of its results. It is important not to ignore the role of diagnostic classifications in striving for equity of access to primary dental services, as there has been an increasing recognition on the accountability of health professionals in the allocation of health resources through diagnoses²⁴. As dentists are end-users of the diagnostic scale, they must be surveyed regarding specific usability attributes of the scale. High level of usability may encourage dentists to adopt this diagnostic classification tool in their daily practice.

The group of experts took into account a wide range of factors to determine activity standards. However, timings for dental hygienists and

community health workers to perform their tasks did not include opinions these staff categories. The lack of a more comprehensive investigation to establish activity standards is a limitation of this research. Furthermore, differences in participants' academic background were not explored, which may have decreased the accuracy of experts' opinions. Although the results of this study are plausible and consistent with theoretical predictions, they should nevertheless be interpreted with caution, because they rely just on the intuitive judgment of the participants rather than evidence.

This work appears to be the first in the primary dental care-related literature that has validated specific wait-time benchmarks for access to different courses of primary dental services delivered by dentists, dental hygienists and community health workers. Equity access to primary dental care is a complex issue requiring prompt attention from public health authorities. Thus, the maximum wait-time benchmarks validated in this research can provide health authorities with standardized and comprehensive approach to programming timely dental care in a transparent and accountable manner.

In this study, face validity of the criteria of the dental resource allocation framework was established, fulfilling a preliminary validation stage. On the basis of expert input, the framework demonstrated its potential ability to promote more equitable access to primary dental services, since equal diagnostic classifications share the same waiting times for the dental care they require.

Considering the novelty of the proposed framework, and the useful information it may produce for equity-based booking systems, it is worth proceeding with its assessment by evaluating the relation between duration of wait and dental health consequences in a real working scenario.

Collaborations

DS Antunes: conceptualization, original draft preparation, investigation, methodology, formal analysis and writing. S Naidoo: conceptualization, supervision, writing-reviewing and editing. NG Myburgh: conceptualization, supervision, writing-reviewing and editing. PD Fisher: supervision, data curation, writing-reviewing and editing. JB Hilgert: supervision, methodology, formal analysis, writing-reviewing and editing. FN Hugo: conceptualization, supervision, methodology, formal analysis, writing-reviewing and editing.

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References

1. Siciliani L, Moran V, Borowitz M. Measuring and comparing health care waiting times in OECD countries. *Health Policy* 2014; 118(3):292-303.
2. Kahokehr A, Glasson J, Studd R. Surgical waiting time for radical cystectomy: a New Zealand experience. *ANZ J Surg* 2016; 86(12):1042-1045.
3. Viberg N, Forsberg B, Borowitz M, Molin R. International comparisons of waiting times in health care--limitations and prospects. *Health Policy* 2013; 112(1-2):53-61.
4. De Coster C, McMillan S, Brant R, McGurran J, Noseworthy T. The Western Canada Waiting List Project: development of a priority referral score for hip and knee arthroplasty. *J Eval Clin Pract* 2007; 13(2):192-196.
5. Geddes J. Waiting is the hardest part. *Maclean's* 2014; 127:18-19.
6. Brasil. Supremo Tribunal Federal (STF). *Despacho de Convocação de Audiência Pública de 05 de março de 2009* [Internet]. Brasília: STF; 2009. Available from: http://www.stf.jus.br/arquivo/cms/processoAudienciaPublicaSaude/anexo/Despacho_Convocatorio.pdf
7. Oliver A, Mossialos E. Equity of access to health care: outlining the foundations for action. *J Epidemiol Community Health* 2004; 58(8):655-658.
8. Pereira C, Roncalli A, Cangussu M, Noro L, Patrício A, Lima K. Impact of the Family Health Strategy: an analysis in cities in Northeast Brazil with more than 100,000 inhabitants. *Cad Saude Publica* 2012; 28(3):449-462.
9. Macinko J, Guanais F, de Fátima M, de Souza M. Evaluation of the impact of the Family Health Program on infant mortality in Brazil, 1990-2002. *J Epidemiol Community Health* 2006; 60(1):13-19.
10. Chan T, Hwang H, Karimuddin A. Wait times for general surgery in BC: Moving beyond measurement. *Br Columbia Med J* 2015;57(8):341-348.
11. Schroth R, Morey B. Providing timely dental treatment for young children under general anesthesia is a government priority. *J Can Dent Assoc* 2007; 73(3):241-243.
12. List D. The Consensus Group Technique in Social Research. *Field Methods* 2001; 13(3):277-290.
13. Brasil. Ministério da Saúde (MS). *Departamento de Atenção Básica, Política Nacional de Saúde Bucal* [Internet]. Biblioteca Virtual em Saúde MS; 2004. Available from: http://bvms.saude.gov.br/bvs/publicacoes/politica_nacional_brasil_sorridente.htm
14. Brasil. Ministério da Saúde (MS). DATASUS. *Sistema de Gerenciamento da Tabela de Procedimentos, Medicamentos e OPM do SUS (SIGTAP)* [Internet]. Available from: <http://sigtap.datasus.gov.br/tabela-unificada/app/sec/inicio.jsp>
15. World Health Organization (WHO). *Workload Indicators of Staffing Need (WISN) Software Manual* [Internet]. 2010. Available from: http://www.who.int/hrh/resources/wisn_software_manual/en/
16. Noseworthy T, McGurran J, Hadorn D. Waiting for scheduled services in Canada: development of priority-setting scoring systems. *J Eval Clin Pract* 2003; 9(1):23-31.

17. Trochim WMK. *Measurement Validity Types* [Internet]. Social Research Methods - Knowledge Base; 2006. Available from: <http://www.socialresearchmethods.net/kb/measval.php>
18. Queensland Health. *Oral Health Services Waiting Lists Guideline* [Internet]. Department of Health. Queensland Government; 2015. Available from: https://www.health.qld.gov.au/__data/assets/pdf_file/0033/365838/qh-gdl-269.pdf
19. Queensland Health. *Open data collections* [Internet]. Health System and Governance Performance. Queensland Government; 2015. Available from: <https://www.health.qld.gov.au/system-governance/performance>
20. National Institute for Health and Clinical Excellence (NICE). *Dental checks: intervals between oral health reviews. Guidance and guidelines NICE* [Internet]. NICE; 2004. Available from: <https://www.nice.org.uk/Guidance/CG19>
21. Riley P, Worthington H, Clarkson J, Beirne P. Recall intervals for oral health in primary care patients. *Cochrane Database Syst Rev* 2013; 12:CD004346.
22. Summerton N. Diagnosis and general practice. *Br J Gen Pract* 2000; 50(461):995-1000.
23. Stevens A, Gillam S. Needs assessment: from theory to practice. *BMJ* 1998; 316(7142):1448-1452.
24. Pitt D, Noseworthy T, Guilbert J, Williams J. Waiting lists: management, legalities and ethics. *Can J Surg* 2003; 46(3):170-175.

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