FDI World Dental Federation

TEN YEARS OF ORAL HEALTH OBSERVATORY DATA

Evidence, Impact and the Road Ahead

ORAL HEALTH OBSERVATORY

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ABBREVIATIONS

AOHSS	Adult Oral Health Standard Set
ENSAB	Estudio Nacional de Salud Bucal
FDI	FDI World Dental Federation
GBD	Global Burden of Disease
GOHAI	Geriatric Oral Health Assessment Index
GOHAP	Global Oral Health Action Plan
ICHOM	International Consortium for Health Outcomes Measurement
LMIC	Low- and middle-income country
NCD	Non-communicable disease
NDA	National Dental Association
OHIP	Oral Health Impact Profile
OHO	Oral Health Observatory
OIDP	Oral Impacts on Daily Performances
SDGs	Sustainable Development Goals
UHC	Universal Health Coverage
UMIC	Upper-middle-income country
WHA	World Health Assembly
WHO	World Health Organization

EXECUTIVE SUMMARY

The Oral Health Observatory (OHO) was launched by FDI World Dental Federation in 2014 to generate standardised, internationally comparable oral health data from primary dental practice. Ten years on, it has collected data from more than 10,000 patients and participating dental practices across 12+ countries spanning all six WHO regions. This report assesses what OHO has delivered over the last decade and the opportunities moving forward.

What OHO has contributed. The programme has moved from proof-of-concept to an evidence base spanning foundational methodology, cross-national analyses, and country-led applied studies. Most publications since 2023 have been National Dental Associations (NDA)- or country-led and several have fed directly into national policy conversations. The indicators measured by OHO data supplement and map closely to the WHO Global Oral Health Action Plan 2023–2030 (GOHAP) monitoring framework, positioning it as a natural complement to national surveillance, particularly in low-income and middle-income countries (including LMICs and UMICs) where national oral health surveys are infrequent or absent.

What the data show. Several participating countries have reached advanced stages of implementation and published their findings, including countries which completed data collection and analysis through a country-led approach (e.g., Japan). This report draws on five country profiles from low-income and middle-income countries (including LMICs and UMICs) where national dental associations implemented the OHO with guidance and support from FDI, including participation in face-to-face data analysis workshops. Together, these profiles demonstrate how OHO data have been collected, analysed and applied in different national contexts, while highlighting recurring challenges across oral health systems. The five country profiles speak to variations of the same story: disease burden sits in places the system isn't configured to manage. In China, strong preventative behaviours do not necessarily translate into better periodontal outcomes. In Colombia, despite strong individual behaviours and treatment capacity, disguised preventive gaps where access and primary prevention remain inequitably distributed are revealed. In India, treatment capacity has improved, but persistent unmet need and a growing chronic disease burden suggest that the health system remains more oriented toward treating illness than preventing it. Lebanon demonstrates how prolonged economic strain disrupts the continuity of care in previously well-functioning treatment systems, fragmenting the patient pathway. In Tanzania, OHO data provide one of the clearest available point-of-care evidence sources for understanding service delivery and informing national policy discussions. Across all five countries, the common thread is a persistent gap between treatment capacity and preventative reach.

What comes next. After consolidating a decade of evidence, four priorities emerge for OHO's path forward. These priorities contribute directly to multiple Sustainable Development Goals, adopted by the United Nations in 2015. These include SDG 3.4 (NCD mortality reduction), through standardised oral disease prevalence data; SDG 3.8 (universal health coverage), by revealing gaps in oral health service access and utilisation; SDG 3.c (health workforce strengthening), through practice-based evidence on clinician capacity and service delivery models; and SDG 10 (reduced inequalities), by capturing socioeconomic gradients in oral health outcomes. Together, they underline that oral health equity cannot be achieved from inside the dental clinic alone. The four priorities that emerge are:

01 **Enhanced alignment with GOHAP monitoring and the WHO**

02 **Systematic NDA-Ministry engagement**

03 **Extension beyond the dental clinic to community and primary care settings to address equity gaps**

04 **Linkage with national health information systems so OHO indicators feed routine surveillance**

I. INTRODUCTION

Oral disease affects an estimated 3.7 billion people worldwide,[1] with a combined global prevalence of 45%, which is higher than any other non-communicable disease (NCD).[2] Dental caries in permanent teeth alone affects approximately 2.3 billion people.[3] Public and private expenditures for oral health care have reached an estimated US$ 387 billion globally,[4] with highly unequal distribution. Oral diseases also disproportionately affect marginalised populations, with a consistent association between lower socioeconomic status and higher prevalence and severity of oral conditions. Despite this scale, oral health has been structurally underrepresented in global health surveillance systems, universal health coverage (UHC) benefit packages and NCD investment cases. The 2021 World Health Assembly (WHA) resolution on oral health (WHA74.5) recognised the need for a paradigm shift from curative to preventive approaches, mandating the Global Strategy on Oral Health and the GOHAP 2023–2030.[2] Most recently, the political declaration of the fourth UN high-level meeting on NCDs and mental health (held in September 2025) explicitly referenced oral diseases, strengthening recognition of oral health within the broader NCD agenda.[5]

FDI published its "*Vision 2030: Delivering Optimal Oral Health for All*" in 2021,[6] which is aligned with the themes set out by GOHAP. The FDI Vision 2030 focuses on three key pillars: universal coverage for oral health, integration of oral health into health and developmental agendas, and building a resilient oral health workforce for sustainability. These pillars are underpinned by education and are designed to deliver quality essential oral health services that are available, accessible, and affordable for all.

OHO serves as a practical mechanism through which all three pillars are advanced, by systematically generating the evidence needed to support universal coverage, inform prevention-focused policy, and strengthen workforce planning. Figure 1 illustrates how OHO's data collection activities map onto each pillar.

Figure 1: OHO's data collection against FDI Vision's pillars.

PILLAR 1

UNIVERSAL COVERAGE FOR ORAL HEALTH

Maps oral health status, behaviours and access needs at population level.

Generates evidence to support UHC benefit design and targeted policy reform.

PILLAR 2

INTEGRATING ORAL HEALTH INTO THE GENERAL HEALTH AGENDA

Links patient perceptions with clinical data and sociodemographic factors.

Supports population and prevention-focused advocacy and policy.

PILLAR 3

BUILDING A RESILIENT ORAL HEALTH WORKFORCE

Captures practice-level data on service delivery and team collaboration.

Enables NDAs to use data for workforce planning and standardisation.

As OHO enters its second decade, this report consolidates evidence into a strategic account of the programme's development, outputs, lessons learned and contribution to global oral health data and policy. It is intended to demonstrate OHO's value to policymakers, global health institutions, FDI member associations and research partners, and to inform future programme priorities.

II. THE ORAL HEALTH OBSERVATORY: PURPOSE, DESIGN AND OPERATIONAL MODEL

WHY THE OHO WAS DEVELOPED

The OHO was established to address a recognised gap in oral health data. The lack of standardised, internationally comparable information linking clinical status, patient experience and behavioural risk factors has meant that oral health has remained consistently neglected in global health policy. Existing data sources, including national oral health surveys, focus predominantly on clinical status, are often resource-intensive, conducted infrequently, and not designed for cross-country comparability.[7]

The OHO was developed as a complementary implementation model, based on routine data collection within dental practices to generate consistent, cross-country data using a common framework. It is closely aligned with the FDI–ICHOM Adult Oral Health Standard Set (AOHSS), which defines a set of patient and clinician-reported outcome measures intended to support international comparability and a more patient-centred understanding of oral health.[7] This psychosocial dimension allows the OHO to capture aspects of oral health experience that purely clinical surveys do not.

However, because the OHO draws on patients attending dental practices, it does not capture those who, for financial, geographic or systemic reasons, do not access care. OHO findings should therefore be interpreted as complementing rather than substituting national epidemiological studies or population-level instruments. Such sources can be taken together with what OHO data provides to offer a more complete evidence base for advocacy and policy formulation.

WHAT THE OHO MEASURES

The OHO captures multiple dimensions of oral health and its determinants within a single dataset, enabling analysis of the relationships between clinical outcomes, subjective outcomes, behaviours, and service use within the same population. The questionnaires were developed by the OHO Task Team using a consensus process drawing on established oral-health related quality of life instruments including the Oral Impacts on Daily Performances (OIDP), the Oral Health Impact Profile (OHIP-14), the Geriatric Oral Health Assessment Index (GOHAI), and WHO Oral Health Survey methods.[8] Participating NDAs also had the opportunity to propose context-specific additions, which were reviewed by the project's expert panel before inclusion.

Table 1: Data domains collected by OHO.

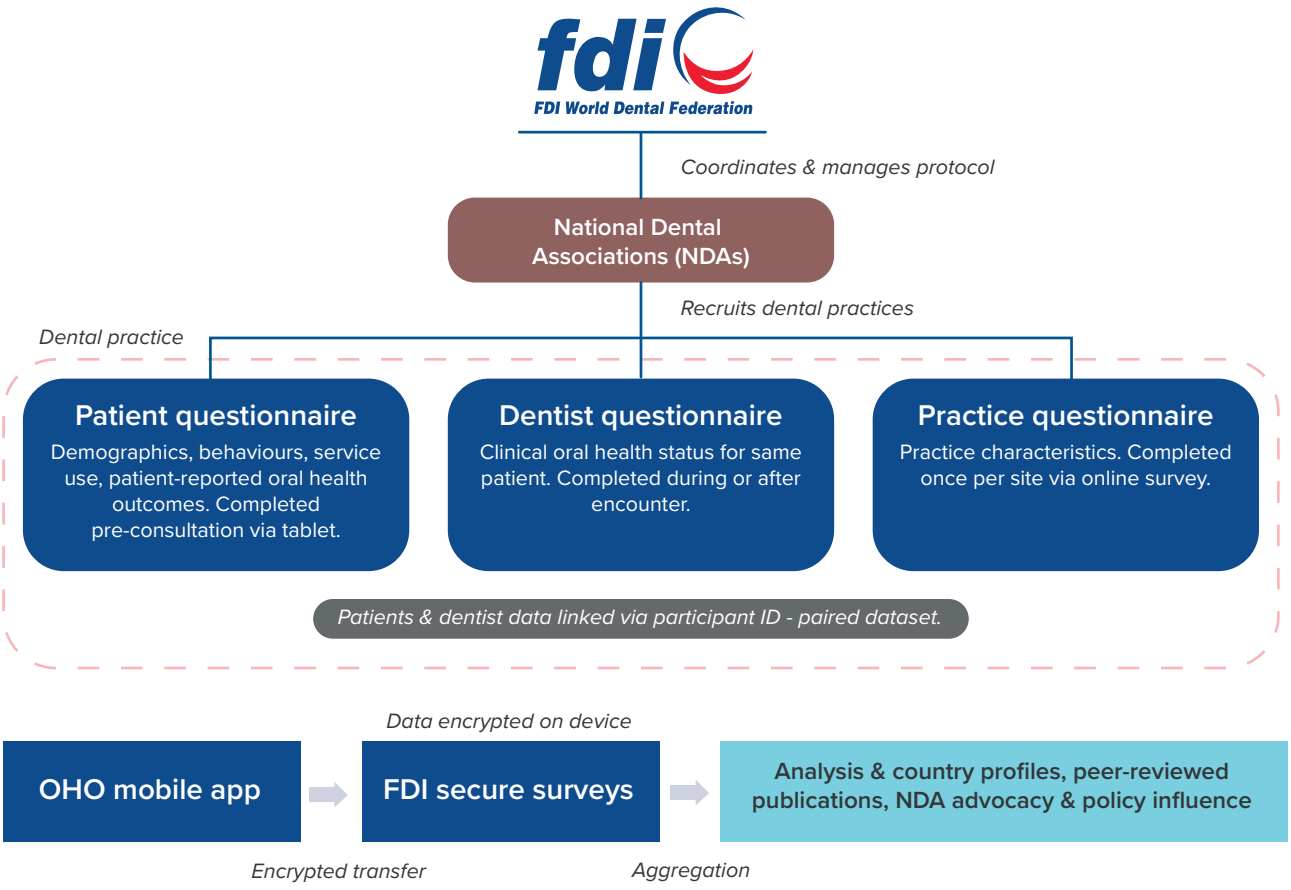
Domain	Source	Description
Clinical oral health status	Dentist	Caries (DMFT components), periodontal status, dentition, sealants, other oral conditions (such as acid erosion, gingivitis).
Oral health behaviours	Patient	Brushing frequency and timing, fluoride product use, dietary sugar intake, tobacco use, alcohol consumption.
Service access and utilisation	Patient	Recency and purpose of dental visits, barriers to care, travel time, insurance status, appointment access.
Patient-reported oral health impacts	Patient	Pain, discomfort, functional limitations (eating, speaking), psychosocial impacts (embarrassment, social participation, sleep), productivity loss.
Sociodemographic characteristics	Patient	Age, sex, education level.
Practice characteristics	Practice survey	Practice type, staffing, patient volume, time allocation, restorative materials, continuing education.

Source: Compiled from the OHO Research Protocol[8] and Taylor et al.[9]

HOW THE OHO WORKS

The OHO system workflow operates through a standardised data collection process embedded within routine dental care. It is structured as a multi-level workflow connecting FDI, NDAs, dental practices, and patients (Figure 2).

Figure 2: OHO system workflow.



Data are collected through three instruments[7,9,10]:

1. **Patient questionnaire.** Capturing sociodemographic characteristics, oral health behaviours, service access and utilisation, and patient-reported oral health outcomes. Completed by the patient pre-consultation using a tablet computer in the clinic waiting room.

2. **Dentist questionnaire.** Capturing clinical oral health status for the same patient, including caries, periodontal status, and dentition. Completed by the dentist during or after the clinical encounter.

3. **Practice questionnaire.** Recording characteristics of the dental practice (type, staffing, service delivery patterns). Completed once per practice via an online registration portal.

This design creates a comprehensive dataset linking patient-reported oral health outcomes with clinician-reported clinical findings at the individual level, connected through participant IDs. Data are encrypted on the user's mobile device, anonymised, and transferred to FDI's secure servers in Geneva for aggregation and analysis. No identifiable patient data are collected at any stage.[11]

IMPLEMENTATION MODEL

OHO is implemented through FDI's network of NDAs, which coordinate the project at country level. NDAs are responsible for recruiting dental practices, supporting implementation, obtaining ethical approval, and facilitating engagement with findings.[7–9]

Dental practices are selected using structured sampling approaches adapted to national context. In the initial study phase, this included stratified cluster sampling of dentists by administrative region. Within practices, patients are selected using a systematic approach based on order of arrival. Participating dentists typically collect data from a defined number of patients over the study period (for example, 50 patients per dentist in the feasibility phase).

Table 2 details the roles of OHO data collection and management across all levels. This model allows implementation across different health system contexts while maintaining a common methodology.

Table 2: Levels and roles for OHO data collection.

Level	Role
FDI	Overall coordination, methodology development, data management, quality assurance, and dissemination of results.
NDAs	Recruitment of national dental practices, ethical approval, training support, stakeholder engagement, and communication of findings.
DENTAL PRACTICES	Data collection using the OHO mobile app, following standardised in-practice procedures and gaining informed consent.
PATIENTS	Provide behavioural, quality-of-life, and demographic data via the patient questionnaire.

Source: Compiled from the OHO Research Protocol[8] and Taylor et al.[9]

III. OHO PARTICIPATING COUNTRIES

The development of OHO reflects a phased programme trajectory, evolving from early pilot testing to multi-country implementation, followed by disruption and subsequent diversification of country engagement pathways. OHO spans all six WHO regions: African Region (AFRO), Region of the Americas (AMRO), South-East Asia Region (SEARO), European Region (EURO), Eastern Mediterranean Region (EMRO), and Western Pacific Region (WPRO).

Initial development began with pilot studies, including proof-of-concept work in the Netherlands and small-scale early implementation in countries such as Germany and Mexico. These early efforts established the feasibility of collecting standardised, paired patient–dentist data within routine dental practice settings and informed the design of the multi-country model.

Building on this foundation, a formal recruitment phase was launched in May 2017. Many countries expressed interest and 12+ countries proceeded to participate in the initial feasibility phase. These included Armenia, China, Colombia, Costa Rica, Germany, India, Italy, Japan, Kenya, Lebanon, Poland, South Africa, and Tanzania. During this period, OHO was implemented across a diverse range of health system contexts, generating one of the first globally standardised, practice-based oral health datasets.[9]

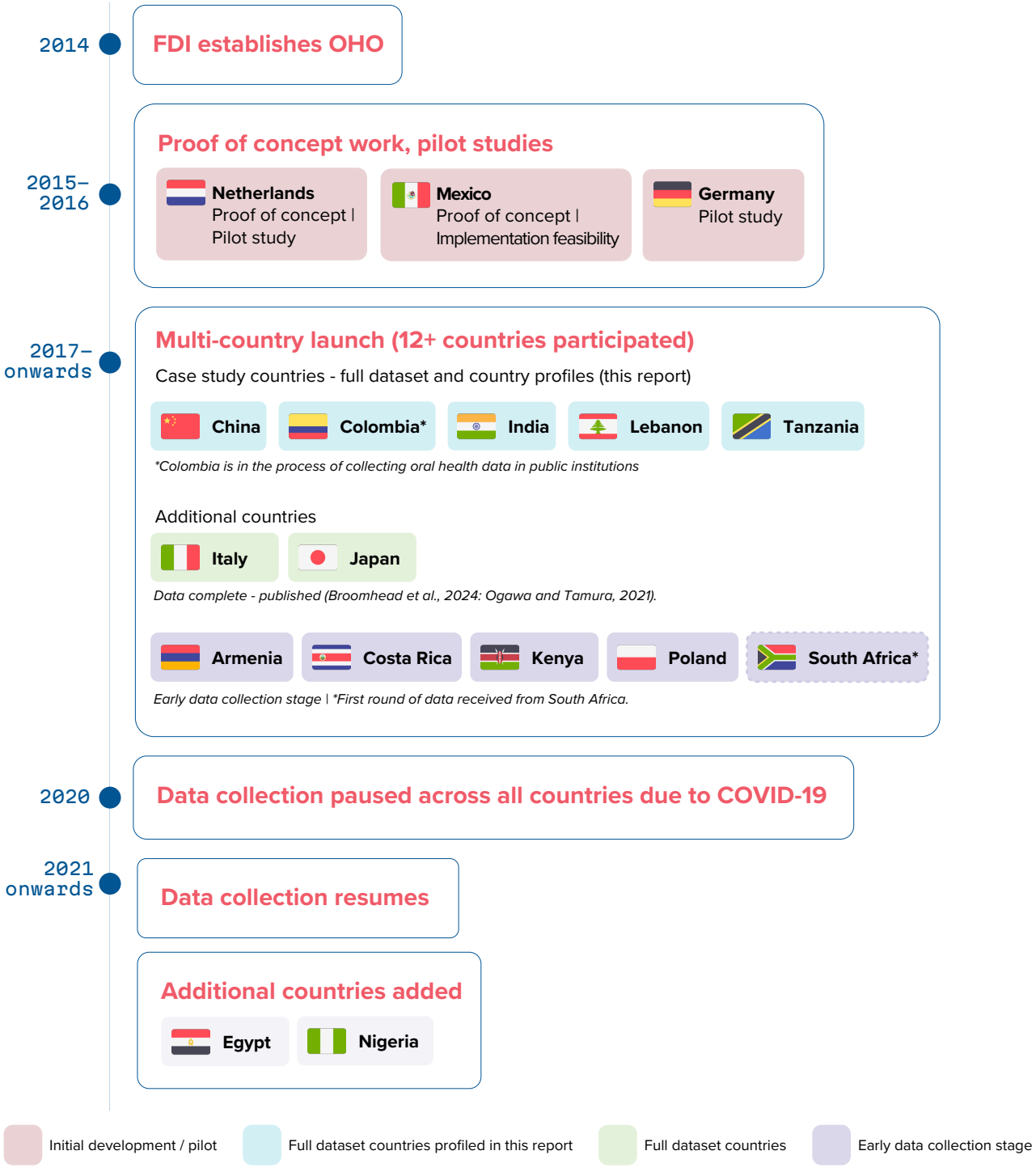
By mid-2020, six countries—China, Colombia, India, Italy, Japan, and Lebanon—had reached the most advanced stage of implementation. This phase provided the core dataset underpinning OHO's early analytical outputs, including cross-country comparative studies and national-level analyses. Japan successfully completed data collection and analysis through a country-led approach and the country's experience demonstrates how OHO data can be successfully generated and applied through strong national leadership. Although Japan is not included among the detailed case studies presented in this report, its contribution represents an important part of the programme's global evidence base.

Data collection across all countries was paused in 2020 due to the COVID-19 pandemic. By this point, countries were at different stages of implementation. Some had completed or partially completed data collection, some were unable to progress beyond early stages (e.g., Armenia), and others resumed or adapted activities at later time points (e.g., Kenya). Additional countries have contributed partial datasets or are in the process of re-engagement and expansion. This variation reflects differences in national capacity, resources, and contextual factors, and is an inherent feature of a decentralised, NDA-led implementation model.

Taken together, the current country portfolio illustrates both the breadth of OHO's global reach and the variation of its implementation across contexts. This variation is not treated as a limitation of the programme, but as an important part of its development trajectory. It provides the basis for assessing how OHO performs across different levels of data maturity, from pilot and interrupted settings to fully realised datasets capable of supporting policy-relevant analysis.

Figure 3 summarises the participation status and data collection progress across all countries, including implementation stage and key milestones. The following sections draw on this portfolio to assess OHO's impact, with particular focus on the five low- and middle-income countries where sustained NDA-led implementation and FDI engagement enables detailed system-level analysis.

Figure 3: Summary of participating countries' progress and current status.



IV. TEN YEARS OF ACHIEVEMENTS: THE IMPACT ASSESSMENT FRAMEWORK

This section assesses the OHO dataset against an impact assessment framework. The framework synthesises evidence spanning the full 2016–2026 period across all participating countries and is structured around three strategic themes built through stakeholder inputs (Figure 4).

Figure 4: Impact assessment themes.

THEME 1

STRATEGIC RELEVANCE AND GLOBAL POSITIONING

THEME 2

ACADEMIC UPTAKE, PEER LEARNING AND POLICY INFLUENCE

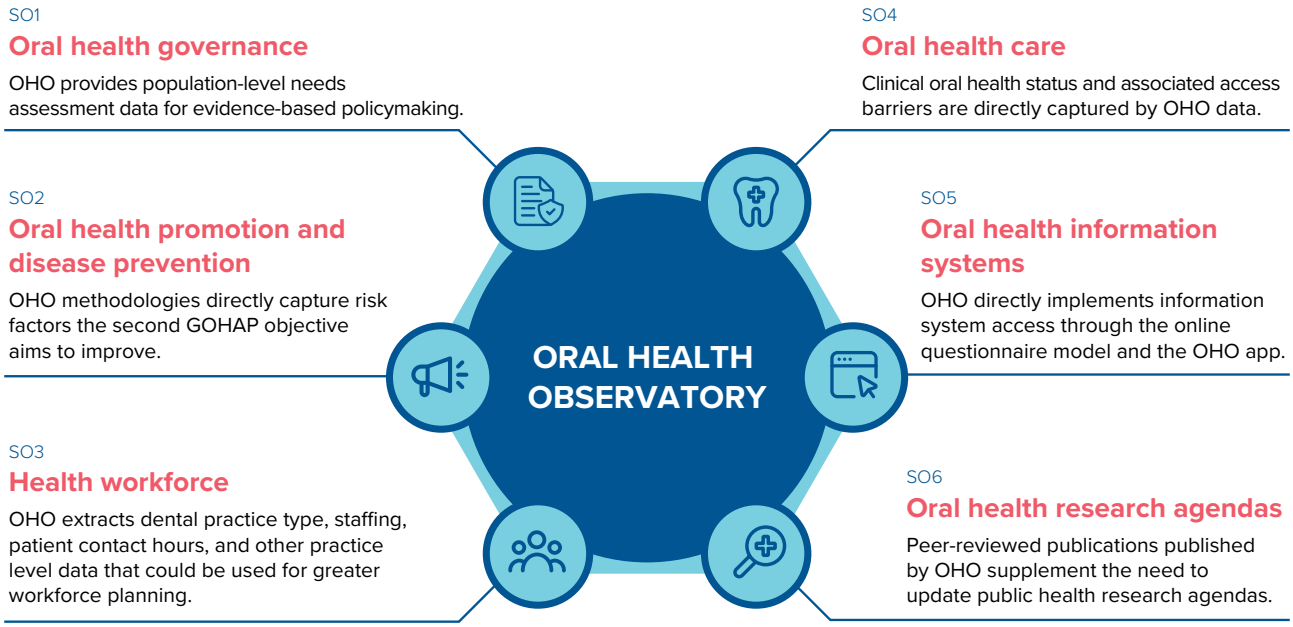
THEME 3

GEOGRAPHIC AND DEMOGRAPHIC REPRESENTATION

THEME 1. STRATEGIC RELEVANCE AND GLOBAL POSITIONING

By integrating patient-reported experiences with clinical indicators, OHO bridges population health monitoring and patient-centred care. Its implementation via NDAs reflects the multi-stakeholder, country-driven approach envisaged in GOHAP,[2] positioning OHO as both a global public health resource and a platform for national action. OHO's data collection domains align with GOHAP strategic objectives (SOs) (Figure 5), with operationalisation described below.

Figure 5: OHO mapped against GOHAP strategic objectives.



Oral health governance (SO1): OHO supports governance by generating data on access to care and unmet need, enabling policymakers to assess population needs among those attending for dental services, identify service gaps, and inform evidence-based planning and resource allocation.

Oral health promotion and disease prevention (SO2): OHO contributes to preventive strategies by systematically capturing behavioural risk factors, such as oral hygiene practices and dietary habits, allowing for the identification of modifiable risks and informing the design of targeted public health interventions.

Health workforce (SO3): OHO provides insights into the dental workforce through practice-level data, including service delivery contexts, thereby supporting workforce planning, distribution, and capacity-building efforts.

Oral health care (SO4): OHO strengthens care provision by collecting standardised clinical and patient-reported oral health outcome data, enabling the assessment of disease burden and its impact on patients, treatment needs, and variations in oral health care across populations.

Oral health information systems (SO5): OHO directly operationalises this by contributing to the development of an oral health information system that implements a standardised, digital data collection platform that enables consistent, scalable, and comparable data generation in primary dental care across countries.

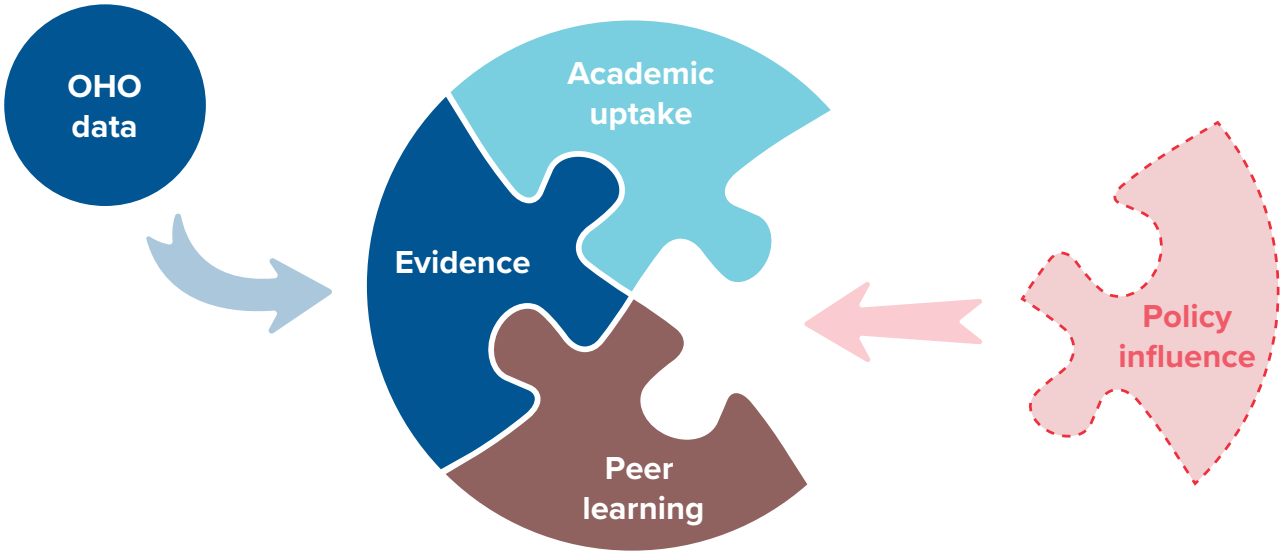
Oral health research agendas (SO6): OHO facilitates research by providing a harmonised, population-based dataset that supports cross-country comparative analysis and the exploration of relationships between sociodemographic, behavioural, clinical variables and patient-reported oral health outcomes.

As a relevant example, Broomhead et al.'s six-country study[11] demonstrated OHO's unique capacity for cross-national comparison using standardised data, a capability that no other civil-society-led oral health data platform provides. Furthermore, OHO's implementation through NDAs reflects the delivery model envisaged in GOHAP, positioning it as a practical and scalable example of civil society engagement in global oral health surveillance.

THEME 2. ACADEMIC UPTAKE, PEER LEARNING AND POLICY INFLUENCE

Over its ten-year history, OHO has evolved from a data collection initiative into a platform that actively supports research, policy development, and advocacy. Across participating countries, its value lies not only in generating standardised data, but in enabling its practical use by NDAs to inform decision-making and drive national action. This section outlines OHO's contribution across three domains: academic uptake, peer learning and policy influence, depicted visually in Figure 6. OHO has reached significant maturity across the first two domains (academic uptake and peer learning), with remaining potential to further solidify policy influence, discussed in this section.

Figure 6: OHO evidence contribution framework.



1. Academic and scientific uptake

Since 2018, OHO has generated nine peer-reviewed publications across two complementary tracks. The first is foundational studies that validated the mobile-app methodology[12] and established OHO as a feasible multi-country data model.[9] The second is applied cross-national analyses drawing on the harmonised dataset. This includes publications on self-reported general health[11] and patient-reported gingival health[13] across six countries. The majority of publications since 2023 have been NDA- or country-led rather than FDI-led, reflecting the programme's maturation into a locally-owned research platform. Table 3 gives details of these publications along with their respective references.

Table 3: List of OHO-linked publications.

N.	Title	Authors	Year	How OHO data were used
1	Collecting standardised oral health data via mobile application: A proof-of-concept study in the Netherlands	den Boer JCL, van Dijk W, Horn V, Hescot P, Bruers JJM.[12]	2018	Proof-of-concept study in the Netherlands testing the OHO mobile app methodology for collecting standardised oral health data. The first published validation of the OHO instrument prior to multi-country deployment.
2	Developing a Standard Set of Patient-centred Outcomes for Adult Oral Health – An International, Cross-disciplinary Consensus	Ni Riordain R, Glick M, Al Mashhadani SSA, Aravamudhan K, Barrow J, Cole D, et al.[10]	2021	Developed the FDI–ICHOM Adult Oral Health Standard Set (AOHSS), a patient- and clinician-reported outcome measure framework that aligns well with OHO data collection. The standard set was developed through a consensus process involving ~30 international experts across five continents.
3	Japanese version of the Oral Health Observatory Project using a mobile application	Tamura K, Ogawa H.[14]	2021	Cross-sectional study using OHO Japan primary data (2018–2019). Analysed associations between patient-reported lifestyle behaviours (brushing frequency, smoking, alcohol, diet) and clinician-assessed oral outcomes (periodontal status, caries, tooth loss). Also examined patient-reported oral health status and dental attendance patterns.

N.	Title	Authors	Year	How OHO data were used
4	Standardised Practice-Based Oral Health Data Collection: A Pilot Study in Different Countries	Taylor S, Baker SR, Broomhead T, England R, Mason S, Sereny M, Tsakos G, Williams DM.[9]	2023	Reported OHO feasibility across 12 countries and assessed data quality from 6 countries (China, Colombia, India, Italy, Japan, Lebanon). Established OHO as a feasible model for international standardised data collection in dental practice.
5	Using Standardised International Oral Health-Related Datasets in 6 Countries	Broomhead T, England R, Mason S, Sereny M, Taylor S, Tsakos G, Williams D, Baker SR.[11]	2024	First cross-national comparative analysis using harmonised OHO datasets across 6 countries (China, Colombia, India, Italy, Japan, Lebanon). Examined associations between self-reported general health and sociodemographics, oral health behaviours, oral impacts, and clinical variables. Demonstrated OHO's unique capacity for standardised international comparison.
6	Assessment of Oral Health Status, Care Seeking Behaviours, and Oral Health-Related Quality of Life among Indian Adults Using the World Dental Federation's Digital Application	Balraj L, Oswal K, Reddy R, Kunjan P, Chandu V, Mathur M.[15]	2024	Cross-sectional survey using OHO app data (2018–2020). Analysed oral health status, care-seeking behaviours, and patient-reported oral health status. Separate from but overlapping with the IDA–FDI main OHO dataset.
7	Patient- and Clinician-Reported Oral Health Data in Primary Dental Care Practices in Lebanon	Daou D, Choufani A, Mashmouchi M, Doumit M.[16]	2025	First peer-reviewed publication of the OHO Lebanon dataset (2019–2020). Reported patient- and clinician-reported oral health data from primary dental care practices. Used structural equation modelling to map pathways between demographic factors, behaviours, and oral health outcomes.
8	India's oral health outlook: challenges, economic impact and need for preventative strategies	Narang P, Dhoble A, Mathur M, Rana S, Mason S, Ali A.[17]	2025	Mixed-method analysis integrating OHO India primary data (2016–2020) with systematic review of secondary literature. Examined economic burden, treatment-seeking behaviours, and policy-level interventions needed for India. Co-authored by IDA and workshop participants including Ministry of Health and Family Welfare, WHO India, and Dental Council of India.
9	Exploring Patient-Reported Gingival Health in Adults Using Standardised International FDI Oral Health Observatory Data	Broomhead T, Kettle J, Mason S, Baker S.[13]	2023	Explored patient-reported gingival health in adults using OHO data from 6 countries (China, Colombia, India, Italy, Japan, Lebanon). Examined associations between self-perceived gum health, sociodemographics, wellbeing, and oral health-related impacts. Extended OHO's analytical scope to patient-reported periodontal outcomes.

In addition to the published studies listed above, several NDA-led analyses are currently in preparation. These include:

1. Two Colombia-based studies (Comparison of Oral Health Habits and Conditions in Colombia: Evidence from ENSAB IV (Colombia's fourth nationally representative oral health survey) and the OHO Survey; Factors Associated with the Perception of Oral Health in Colombia: An Analysis Using Ordinal Logistic Models) examining public–private oral health comparisons and predictive models for oral health perception,[18,19]

2. A Tanzania Dental Association–led analysis of socio-demographic predictors of oral health impact, which will represent the first published analysis of OHO data from sub-Saharan Africa,[20] and

3. Additional Chinese-language outputs drawing on OHO data collected in China (Dental Caries Status and Associated Factors Among Adult Patients Attending Dental Clinics in China: Findings from the FDI Oral Health Observatory; Prevalence and Correlates of Periodontal Disease in China: Results from the Oral Health Observatory).[21]

These forthcoming publications are expected to broaden the analytical depth of the OHO evidence base, particularly around comparative national analyses and country-led applied research.

2. Peer-learning

OHO has strengthened the advocacy capacity of NDAs by providing a robust, country-specific evidence base to support engagement with policymakers. By linking behavioural, clinical, patient-reported and access-related data, it allows for more targeted and contextually grounded advocacy. Across countries, OHO findings have been used to support policy discussions on key public health priorities (Table 4). The availability of comparable data across countries further reinforces these efforts, enabling shared advocacy messages and strengthening engagement at both national and global levels.[16]

Table 4: Peer-learning activities conducted using OHO data.

Country	Latest reported use of OHO data
China	Findings have been compared to national oral health survey data, with OHO providing complementary practice-based evidence to supplement where national survey data is unable to present a comprehensive view of oral health.[22]
Colombia	Colombia's NDA has proposed a permanent national oral health observatory combining OHO data with administrative records and national statistics and has linked OHO findings to advocacy for taxation on sugary drinks, tobacco, and alcohol.[18,19] Colombia has also extended OHO data collection to public institutions, broadening coverage to a different socioeconomic population and enabling the first direct comparison between private and public dental care settings within the programme.
India	OHO data used as an evidence base for national advocacy on tobacco and sugar consumption, contributing to the Mumbai Declaration on Sugary Drinks and Healthy Food and the introduction of monthly institutional "Less Sugar" campaigns. Findings were presented to the Ministry of Health and Family Welfare, strengthening public–private partnerships and oral health literacy nationally.[22,23]
Kenya	Active data collection ongoing using the latest app version. Participated in WDC 2025 breakout group on data collection challenges.[22]
Lebanon	OHO findings compiled into an FDI Council approved results brief used to facilitate a national NDA workshop, directly informing Lebanon's first national oral health strategy (September 2024), structured around five WHO GOHAP-aligned objectives. The strategy's fifth objective explicitly references OHO's digital methodology as a model for national information systems. The Lebanese Dental Association has also proposed establishing a formal dental office within the Ministry of Public Health to strengthen NDA–government coordination.[16,22,24]
South Africa	Participated in WDC 2025 workshop; with data collection intended to resume in 2026 after being interrupted by COVID-19.[22]
Tanzania	OHO data has been presented within legislative and policy spaces, including discussions around the Universal Health Insurance Act (2023) and the development of the National Oral Health Strategic Plan (2026–2031). The NDA has referenced OHO findings in advocacy conversations[20] around taxes on sugar-sweetened beverages and for expanded dental coverage under UHI and has proposed exploring the alignment of OHO clinical indicators with the national DHIS2 system for real-time monitoring.

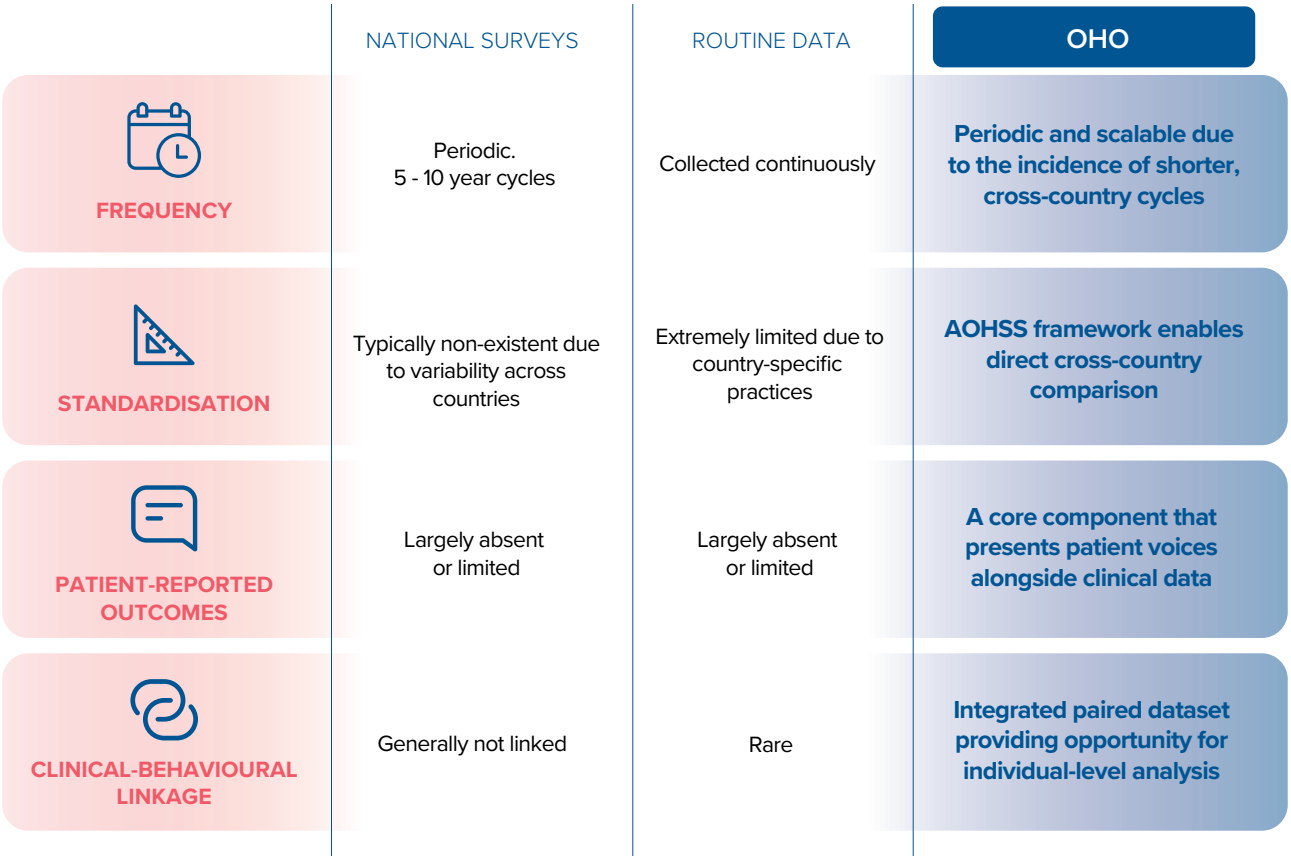
3. National policy and strategy influence

Across participating countries, OHO is beginning to demonstrate how practice-based data can support policy development, advocacy and system-level decision-making. While this function is not yet fully embedded, emerging examples show that policy influence is both feasible and already under way, as exemplified by Lebanon and India.

This capacity for policy influence is underpinned by the specific characteristics of the OHO dataset. Its standardised methodology enables cross-country comparison, strengthening the credibility of national findings within global policy dialogues. At the same time, the integration of clinical indicators, behavioural risk factors, and patient-reported oral health outcomes within a single, paired dataset allows for a more complete understanding of oral health systems, linking disease burden to its underlying drivers and lived experience. Of particular relevance for policy engagement is OHO's capture of psychosocial and functional impacts, including pain, difficulty with everyday activities, and patient-reported oral health outcomes, aligned with the FDI–ICHOM Adult Oral Health Standard Set. These dimensions go beyond clinical counts of disease prevalence to quantify how oral conditions affect daily life, translating epidemiological data into the language of societal burden that health ministries and policymakers respond to. This makes the evidence inherently policy-relevant, supporting not only problem identification but also a compelling case for preventive investment and system change.

In addition, OHO's periodic and scalable data collection model enables the generation of timely insights, which can be aligned with national policy cycles and advocacy windows. This distinguishes OHO from traditional survey-based systems, which are often infrequent, and from routine administrative data, which lack behavioural and patient-centred dimensions. As such, OHO complements existing data sources by providing actionable, context-specific evidence that can be directly used in policy engagement (Figure 7).

Figure 7: OHO's complementarity with other data collection systems.



Experience across countries shows that the presence of data alone does not guarantee policy impact. The presence of a clear translation pathway from data to impact is where OHO has been able to influence policy, which typically includes:

1. **The development of policy-facing outputs such as national briefs and targeted analyses.**

2. **Structured engagement between NDAs and Ministries of Health, including workshops and advisory processes.**

3. **Alignment of OHO findings with national priorities and global frameworks such as the WHO GOHAP.**

Where these elements have been present, as in Lebanon and India, OHO has contributed directly to policy processes. Where they are absent, its role has remained primarily documenting the situation and providing some analytical input.

Across other settings, there are early indications of this transition, including the use of OHO data in legislative discussions, advocacy for fiscal and prevention policies, and proposals for integration into national health information systems. These developments suggest that OHO is both generating evidence and beginning to function as a bridge between data and decision-making.

Overall, OHO addresses a critical gap in the oral health policy landscape by responding not only to the absence of data, but also to the absence of integrated, policy-ready evidence. Strengthening the programme's capacity to translate that evidence into policy action represents a key opportunity for its next phase.

THEME 3. GEOGRAPHIC AND DEMOGRAPHIC REPRESENTATION

OHO has achieved substantial geographic reach over its first decade, with participation spanning all six WHO regions and encompassing a diverse mix of high-, upper-middle-, and lower-middle-income country contexts. Though coverage depth varies, with single-country representation in SEARO (India), EMRO (Lebanon), and AMRO (Colombia),[8,22,23] addressing these gaps will be important if OHO is to function as a global surveillance platform that reflects the full distribution of global oral disease burden. In addition, because OHO data are collected through dental practices, they reflect treatment-seeking populations rather than the general population and are likely to under-represent groups with poorer access to care.

Reliance on NDA-member practices may also skew samples towards urban, higher-income, and more educated groups, depending on the structure of the national dental workforce. In many countries, small subnational samples limit regional or equity analyses, while the lack of economic variables in the current AOHSS framework restricts assessment of financial barriers and cost-related inequalities.

These limitations define the current scope of OHO rather than its value. The dataset provides a detailed picture of people who reach dental care, a perspective often missing from national surveillance systems. However, it needs to be complemented with broader inclusion of populations outside routine dental services in order to fully align with global equity goals.

Looking ahead, strengthening demographic representation will require an extension of the OHO model. This may include exploring data collection in community and primary care settings, developing approaches to reach non-attenders, and expanding participation in under-represented regions. These priorities are closely aligned with WHO GOHAP's emphasis on equity and the principle of leaving no one behind[2] and represent a key area for development in OHO's next phase. Table 5 summarises the geographic and demographic representation in the OHO dataset.

Table 5: Geographic and demographic representation.

Dimension	Status	Summary
Global geographic coverage	SIGNIFICANT	Coverage spans all WHO regions, demonstrating genuinely global reach. However, participation remains uneven within regions, with gaps in Southeast Asia, South America, and parts of sub-Saharan Africa.
Equity of country representation	SIGNIFICANT	Strong participation from LMICs and UMICs aligns with the global distribution of oral disease burden. Representation from high-income countries is more limited (Italy, Japan), supporting an equity-oriented evidence base.
Population representativeness	CONSTRAINED	Practice-based sampling captures treatment-seeking populations only. Non-attenders, rural populations, and lower-income groups are underrepresented, limiting generalisability to the broader population.
Subnational and demographic depth	LIMITED	Subnational sample sizes are relatively small, restricting regional analysis. Absence of economic variables limits assessment of financial barriers and equity.
Expansion trajectory	IN PROGRESS	Pipeline countries (e.g. Egypt, Nigeria, South Africa) indicate continued geographic expansion, particularly in under-represented regions.
Future system integration	EMERGING	Potential for real-time national surveillance has been recognised[8], with integration into systems such as Tanzania's DHIS2 proposed.[20]

V. COUNTRY HIGHLIGHTS AND CASE STUDIES

The country profiles that follow bring the OHO evidence base to ground level. They show how the same standardised instrument produces distinct national pictures, and how each NDA has used that picture to argue for change at home.

Five countries are profiled in depth: China, Colombia, India, Lebanon, and Tanzania.[25–29] Together they span five WHO regions, a range of income levels, and different stages of data maturity.

Each profile draws on the paired patient–dentist dataset to summarise what the data show about oral health in the country's treatment-seeking population. The findings describe patients who attended participating dental practices during the study period—their characteristics, behaviours, clinical status, and oral health impacts. They are not national prevalence estimates, but instead reflect the population that reaches care, not the population that does not. Read together, they also highlight where practice-based evidence complements, diverges from, or fills gaps left by national surveys.

The profiles follow the same eight-section structure (Table 6), designed for consistency across countries and to provide digestible insights from a broad range of data categories. Each closes with a forward-looking synthesis of priorities for the next phase of work.

Table 6: Country profile structure.

Section		What it covers
01	**Country context & sample profile**	The national oral health landscape, relevant health system features, and key sample characteristics.
02	**Access indicators**	Insurance coverage, time to appointment, last dental visit, visit purpose, and reasons for care, a snapshot of how and why patients reach the system.
03	**Disease burden**	Clinical findings from the dentist questionnaire relating to caries, filled and missing teeth, periodontal status, and the treatment gap ratio.
04	**Patient-reported oral health outcomes**	Patient-reported oral health impacts on daily life on pain, discomfort, eating, speaking, sleep, social participation, and work.
05	**Behaviours & risk factors**	Oral hygiene practices, fluoride use, tobacco consumption, alcohol, and dietary sugar intake.
06	**Key findings**	A synthesis of the most important findings from the data, framed for advocacy and policy use.
07	**Data collection & NDA experience**	The NDA's view of programme value, implementation challenges encountered during collection, and recommendations for future rounds.
08	**What the data tell us**	A forward-looking synthesis, including priorities for the next phase of work, framed for NDAs, policymakers, and partners.

CHINA

2,233
adult patients

01 COUNTRY CONTEXT & SAMPLE PROFILE

China's oral health profile shows improved hygiene practices but a continuing high periodontal disease burden. The 4th National Oral Health Survey (NOHS) reported caries prevalence of 62.7% among adults aged 35–44 and periodontal disease rates above 80% in adults over 35. The OHO sample (N=2,233) is younger (53.1% aged 18–34) and more educated (56% degree-level or above) than the general population, providing complementary practice-based evidence alongside national survey data.

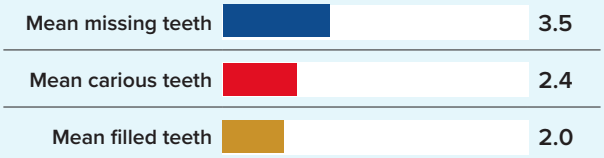
02 ACCESS INDICATORS

88.6%	20.0%	6.8%	53.2%	35.6%
No dental insurance	Emergency presentation	Never seen a dentist	Last visit < 1 year	Check-up visit

When patients present for care, the system responds relatively promptly. Forty-nine percent secured an appointment within 24 hours. However, 88.6% of patients had no dental insurance, and one in five attended for emergency treatment. The overall picture is consistent with a system where limited financial protection reduces preventive attendance, with patients tending to seek care in response to acute need rather than routine maintenance.

03 DISEASE BURDEN

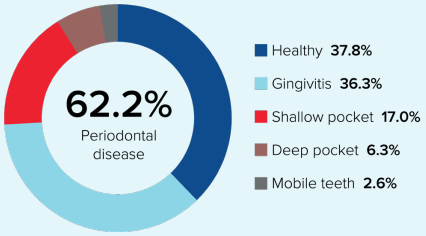
CARIES, TREATMENT & TOOTH LOSS (ADULTS)



Treatment gap ratio 1.2 : 1 for every filled tooth, 1.2 carious teeth remain untreated.

72.6% of patients had at least one carious tooth (1,537 of 2,116), with a mean of 2.4 carious teeth per patient. Mean filled teeth: 2.0. Notably, **70.1% had at least one filling**, indicating that a substantial majority have had some prior access to restorative care.

PERIODONTAL STATUS (ADULTS)



62.2% of patients had some form of periodontal disease, comprising gingivitis (36.3%), shallow pockets 4–5 mm (17.0%), deep pockets >6 mm (6.3%), and mobile teeth (2.6%). 37.8% were periodontally healthy.

04 PATIENT-REPORTED ORAL HEALTH OUTCOMES

44.3%	35.5%	29.0%	18.8%
Oral discomfort	Oral pain	Oral appearance affected job interviews	Working adults missed work **(mean 4.3 days)**

The mean quality-of-life impact score was 6.04 out of 45 (median 4, range 0–43). Oral discomfort was the most commonly reported domain, followed by oral pain. Functional impacts included difficulty eating (26.2%) and missed work (18.8% of working patients, with a mean of 4.3 days off among those affected).

05 BEHAVIOURS & RISK FACTORS

PROTECTIVE FACTORS

82%	79%	38%
Fluoride toothpaste	Brush ≥2x daily	Never drink alcohol

RISK EXPOSURES

27%	35%	26%
Any tobacco use	Sugary food >1x day	Sugary drinks > 1x day

Home-care practices are well established but dietary exposures remain elevated. More than a third of patients consume sugary food more than once daily and a quarter consume sugar-sweetened beverages once daily. More than one in four patients are current tobacco users (27%), operating as a structural driver of oral disease risk.

06 KEY FINDINGS

1. BEHAVIOUR IS NOT THE BOTTLENECK

Strong home-care practices (79% brush twice daily, 82% use fluoride) are not reflected in periodontal outcomes. This suggests access to professional periodontal care, rather than individual behaviour, may be the more significant limiting factor.

2. FINANCIAL PROTECTION SHAPES ATTENDANCE

88.6% of patients have no dental insurance. Limited financial coverage appears to defer preventive attendance, consistent with the relatively high share of emergency presentations (20.0%).

3. DISEASE CARRIES ECONOMIC AND SOCIAL COSTS

18.8% of working patients missed work (mean 4.3 days); 29.0% indicated that oral appearance affected their ability to interview for employment.

4. MODIFIABLE RISK FACTORS REMAIN PREVALENT

27% of patients are current tobacco users and 35% consume sugary food more than once daily. Both are directly associated with the observed disease burden and amenable to targeted intervention.

07 DATA COLLECTION & NDA EXPERIENCE FROM THE CHINESE STOMATOLOGICAL ASSOCIATION

Programme value

The CSA considers OHO a valuable model for standardised oral health data collection at scale. The paired patient–clinician dataset was informative for both clinical quality purposes and national advocacy. There is strong institutional interest in developing OHO as a foundation for a national oral health surveillance system aligned with FDI Vision 2030.[6] OHO data's value is also in the process of being instrumental to two upcoming publications identified by the CSA, with the titles: "Dental Caries Status and Associated Factors Among Adult Patients Attending Dental Clinics in China: Findings from the FDI Oral Health Observatory" and "Prevalence and Correlates of Periodontal Disease in China: Results from the Oral Health Observatory".[30]

Implementation experience

The OHO app was inaccessible via Google Play in China, requiring individual tablet pre-installation across 63 clinics. Geographic scale and uneven dentist distribution created sampling challenges. Seven CSA staff coordinated weekly follow-up. Voluntary, unremunerated participation constrained engagement pace and completeness throughout the data collection period.

CSA advocacy priorities and OHO alignment

Develop a China-compatible app distribution or offline data entry option; adapt the sampling design to account for regional heterogeneity; explore Continuing Professional Development (CPD) accreditation or professional recognition for participating dentists; and establish a clear pathway for translating OHO outputs into policy-facing materials that demonstrate value to clinics and the wider dental profession.

08 WHAT THIS POINTS TOWARD

China's OHO data describe a population with strong oral hygiene habits yet a substantial periodontal disease burden that requires professional management beyond home care. The findings are consistent with a care model oriented toward episodic, reactive treatment rather than chronic disease prevention. Priorities for the next phase include **expanding insurance coverage for preventive services, integrating periodontal screening into routine care**, and using OHO as a complementary evidence base to support national oral health surveillance between National Oral Health Survey cycles.

Sources: OHO Dataset China as analysed by Triangulate Health[25] validated through NDA consultation.[21] Published sources: Taylor et al.[9]; Broomhead et al.[11]

COLOMBIA

1,112
adult patients

01 COUNTRY CONTEXT & SAMPLE PROFILE

Colombia has a well-developed private dental sector alongside persistent oral health inequalities by income, geography, and service type. ENSAB IV (Colombia's fourth nationally representative oral health survey) documents high caries prevalence, periodontal disease, and clear socioeconomic gradients. Recent OHO data collection in 26 public institutions will enable direct comparison between public and private dental populations using the same instrument. The OHO Colombia private-sector dataset includes 1,112 paired adult records, coordinated by the Federación Odontológica Colombiana.

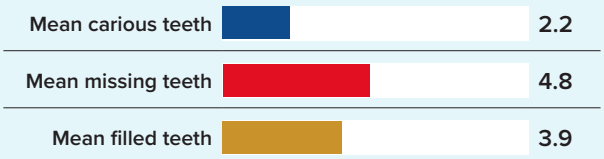
02 ACCESS INDICATORS

2.0%	58.5%	53.5%	11.0%	24.4%
Never seen a dentist	Check-up visit	Last visit < 1 year	Emergency presentation	Travel > 1 hour

Within this private-sector sample, access indicators are comparatively favourable — but these findings reflect only individuals who successfully reached participating private practices and do not support conclusions about population-level access. Only 2.0% had never seen a dentist, 58.5% presented for check-ups and emergency visits accounted for just 11.0% of presentations. This reflects the characteristics of a private-sector, treatment-seeking sample in a country with developed urban dental infrastructure.

03 DISEASE BURDEN

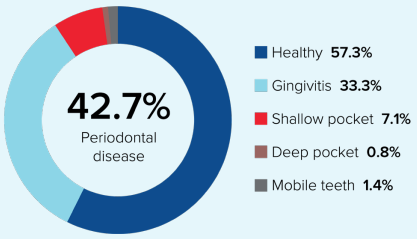
CARIES, TREATMENT & TOOTH LOSS (ADULTS)



Treatment gap ratio 0.6 : 1
representing more fillings than active caries.

74.7% of patients had at least one carious tooth, with a mean of 3.9 filled teeth per patient against 2.2 carious teeth. This reflects restorative care delivery to the treatment-seeking population. However, the mean of 4.8 missing teeth reflects cumulative tooth loss.*

PERIODONTAL STATUS (ADULTS)



42.7% of adults had some form of periodontal disease, comprising gingivitis (33.3%), shallow pockets 4–5 mm (7.1%), deep pockets >6 mm (0.8%), and mobile teeth (1.4%). 57.3% were periodontally healthy.

04 PATIENT-REPORTED ORAL HEALTH OUTCOMES

18.7%	19.3%	13.6%	8.1%
Oral pain	Difficulty eating	Embarrassed to smile	Working adults missed work **(mean 3.5 days)**

Quality-of-life impacts in Colombia may partly reflect the sample's private-sector access and comparatively lower disease burden; age-stratified data are not presented here, and a direct test of the age-distribution hypothesis is not possible from the indicators shown. Oral discomfort was the most commonly reported domain (23.1%), followed by difficulty eating (19.3%) and oral pain (18.7%). About 8% of working adults reported missing work due to oral health concerns.

05 BEHAVIOURS & RISK FACTORS

PROTECTIVE FACTORS

81.7%	83.4%	45.2%
Brush ≥2x daily	Non-smokers	Never drink alcohol

RISK EXPOSURES

16.6%	51.8%
Any tobacco use	Self-rated OH fair/ poor

** The cross-sectional data cannot indicate whether this represents an ongoing trend or a cohort effect, nor whether prosthetic rehabilitation has been provided.*

Colombia's protective profile is strong for brushing frequency: 81.7% brush at least twice daily. This sits alongside a persistent caries burden, however, raising the hypothesis that brushing frequency alone may be insufficient to prevent caries without adequate fluoride toothpaste coverage, a question this dataset cannot answer directly, as fluoride toothpaste data were not collected in the Colombia instrument. Any tobacco use was recorded in 16.6% of adults. Over half of the sample rated their oral health as fair / poor.

06 KEY FINDINGS

1. RESTORATIVE CARE IS REACHING THIS POPULATION

A 0.6:1 treatment gap and 57.3% periodontal health rate suggest restorative care is reaching the private-sector attendees captured in this dataset. The cross-sectional design cannot establish whether care was timely, equitable, or clinically effective.

2. BRUSHING IS STRONG; FLUORIDE DATA ARE MISSING

81.7% brush twice daily. However, the absence of a fluoride toothpaste variable in the Colombia instrument is a structural data gap that limits the interpretation of preventive behaviour and cross-country comparability.

3. THE PRIVATE–PUBLIC GAP

OHO captures a private-sector sample with comparatively favourable outcomes. ENSAB IV shows 69% difficulty chewing nationally. The FOC's new public institution data collection will be the first direct private-to-public comparison in the OHO programme.

4. ACCESS BARRIERS PERSIST

24.4% of patients travelled more than one hour to reach care. Among those who do not access care at all — disproportionately rural, lower-income, and younger populations according to ENSAB IV — barriers are likely more pronounced, though the current OHO dataset does not capture non-users of dental services and this inference draws on national survey evidence rather than OHO data. Sugar, tobacco, and access equity are the FOC's stated policy priorities.

07 DATA COLLECTION & NDA EXPERIENCE FROM THE FEDERACIÓN ODONTOLÓGICA COLOMBIANA

Programme value

The FOC considers the OHO dataset a valuable complement to ENSAB IV for understanding the private dental care population. The linked patient–dentist structure and the bilingual data collection process are identified as particular methodological strengths. OHO findings have been used to support advocacy on sugar taxation, tobacco control, and access to care, and the programme presented data to the 2024 FDI World Dental Congress in Istanbul. Colombia has proposed a permanent national oral health observatory combining OHO data with administrative records and national statistics.[23]

Implementation experience

Data collection was conducted in 2019–2020 in private dental practices across Spanish and English instruments. The bilingual design required harmonisation of response codes during analysis (Spanish values mapped to English equivalents across periodontal status, visit purpose, and clinical fields).

FOC advocacy priorities and OHO alignment

National oral health priorities are directly supported by OHO evidence: sugar and ultra-processed food taxation (OHO documents caries burden in an educated, high-brushing population, reinforcing the case for structural dietary policy); tobacco control (16.6% any-tobacco); access equity and primary prevention (24.4% travel >1hr; check-up rate high among current users but ENSAB IV shows broader population underservice); and the 'Soy Generación Más Sonriente' national strategy, which emphasises early-life prevention and fluoride varnish.[31]

08 WHAT THIS POINTS TOWARD

Colombia's OHO data describe a private dental care population with comparatively strong oral hygiene practices and restorative care access, yet persistent caries burden, missing tooth accumulation, and significant access barriers point to a system that provides restorative access to those who reach private care — though treatment outcomes, quality of care, and long-term effectiveness were not assessed — while population-wide prevention remains underdeveloped. **The most important development is Colombia's extension of OHO to 26 public institutions**, which will enable the first direct private-to-public comparison in the programme. This positions Colombia to demonstrate one of OHO's most valuable potential uses: quantifying equity gaps and informing the case for **primary prevention, fluoride access, sugar policy, and universal health coverage**.

Sources: OHO Dataset Colombia as analysed by Triangulate Health[26] validated through NDA consultation.[31] Published sources: Taylor et al.[9]; Broomhead et al.[11]. Internal documents provided by FDI: Pinto Morales et al.[18]; Pinto Morales et al.[19]

INDIA

2,030
adult patients

01 COUNTRY CONTEXT & SAMPLE PROFILE

India carries the world's highest aggregate oral disease caseload, with an estimated 632 million cases reported in the Global Burden of Disease analysis.[3] Access to dental care is profoundly unequal: 95% of dentists work in the private sector, and the rural dentist-to-population ratio is estimated below 1:250,000 in many states.[32] The OHO India dataset (n=2,030 adults) is one of the largest single-country OHO samples. Data were collected across English and Hindi instruments, drawing on IDA member practices.

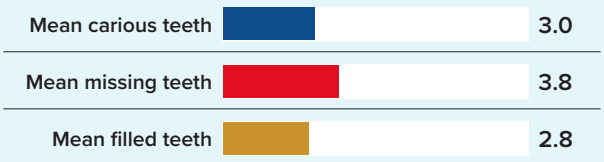
02 ACCESS INDICATORS

11.1%	13.9%	8.4%	50.2%	47.2%
Never seen a dentist	Emergency presentation	Travel > 1 hour	Last visit < 1 year	Check-up visit

Attendance patterns suggest a partially functioning care pathway: half of patients visited within the past year (50.2%), 58.5% are regular attendees, and nearly half (47.2%) presented for check-ups rather than emergency treatment. However, 11.1% had never seen a dentist, and the relatively low emergency rate (13.9%) likely reflects the treatment-seeking composition of the sample rather than universal access. Check-up attendance declined markedly after age 35, while emergency presentations remained steady across working-age groups, a pattern consistent with deferred preventive care.

03 DISEASE BURDEN

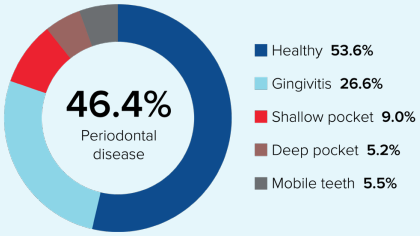
CARIES, TREATMENT & TOOTH LOSS



Treatment gap ratio 1.1 : 1
representing near parity, but not yet a closed gap.

The near-equal ratio of carious to filled teeth (3.0 vs 2.8) suggests restorative services are partially reaching the treatment-seeking population. However, the gap is not closed: **one in nine adults had never seen a dentist.**

PERIODONTAL STATUS



46.4% of adults had some form of periodontal disease, comprising gingivitis (26.6%), shallow pockets 4–5 mm (9.0%), deep pockets >6 mm (5.2%), and mobile teeth (5.5%). 53.6% were periodontally healthy. The 5.5% prevalence of mobile teeth is an India-specific finding not recorded in other OHO countries.

04 PATIENT-REPORTED ORAL HEALTH OUTCOMES

30.9%	31.7%	17.2%	14.3%
Oral pain	Difficulty eating	Embarrassed to smile	Working adults missed work **(mean 10 days)**

Difficulty eating (31.7%) and oral pain (30.9%) were the most frequently reported functional impacts. Roughly 14% of working adults reported missing work due to oral health conditions.

05 BEHAVIOURS & RISK FACTORS

PROTECTIVE FACTORS

85%	53.5%	62.5%
Fluoride toothpaste	Brush ≥2x daily	Never drink alcohol

RISK EXPOSURES

30%	16.6%	2.7%
Any tobacco use	Cigarette smokers	Physician assessed pre-cancer / oral cancer

Oral hygiene practices are reasonably well established, with 85% fluoride toothpaste use and 53.5% brushing twice daily. These figures sit alongside a high disease burden, which reinforces the view that individual behaviour, while relevant, is not the primary determinant of oral health outcomes in this population. Tobacco use is the most significant modifiable risk factor. Any tobacco use was recorded in 30% of adults, encompassing cigarette smoking (16.6%) but also chewing tobacco and areca nut/paan. India carries approximately one third of the global oral cancer burden, and the 2.7% prevalence of oral cancer or pre-cancerous lesions in this sample is directly associated with smokeless tobacco use. The OHO dataset is one of the few sources of practice-based data on this exposure in the Indian context.

06 KEY FINDINGS

1. AWARENESS OUTPACES ACCESS

86.5% of adults recognise that oral health affects their general wellbeing. Yet 11.1% have never seen a dentist, check-up attendance declines after age 35, and disease burden remains high. The gap is structural, not attitudinal.

2. TOBACCO IS A DISTINCTIVE AND URGENT RISK

30% any-tobacco use, including chewing tobacco and areca nut, drives India's disproportionate oral cancer burden (2.7% pre-cancer/cancer in this sample). Smokeless tobacco forms are substantially underrepresented in most global datasets.

3. THE TREATMENT GAP IS NARROWING BUT NOT CLOSED

The 1.1:1 caries-to-fillings ratio suggests the system is partially reaching the treatment-seeking population. Mobile teeth in 5.5% of adults indicates that a subset is presenting with advanced, preventable disease.

4. PRODUCTIVITY LOSS

14.3% of working adults missed work due to oral health problems, averaging 10 days per affected worker. Oral disease is imposing a direct economic cost on the workforce, a figure that links to India's NCD burden and the business case for integrating oral health into employer and primary care frameworks.

07 DATA COLLECTION & NDA EXPERIENCE FROM THE INDIAN DENTAL ASSOCIATION

Programme value

The IDA considers OHO a significant contribution to India's oral health evidence base. The dataset has been presented at senior policy forums, including a February 2023 workshop attended by the Ministry of Health and Family Welfare, WHO India, the Dental Council of India, and academic partners, placing OHO findings directly before decision-makers. The programme generated two peer-reviewed outputs[15,17] and provided data underpinning national advocacy on tobacco, sugar, and access to care.

Implementation experience

The OHO project in India was implemented across IDA member practices using a modified systematic sampling approach. Each working day, one patient was surveyed in order of arrival. Data collection involved three language/instrument variants (English patient, English default, Hindi). The scale of India's geography and the predominance of private practice created inherent challenges in achieving representative geographic coverage as the dataset skews toward urban, English-speaking, and private-sector settings.

IDA advocacy priorities and OHO alignment

IDA is advancing key oral health agendas supported by OHO evidence: tobacco and sugar control; improved care-seeking; geriatric oral health and frailty; school oral health; and integration of dental care into primary healthcare. OHO data also informed the Mumbai Declaration on Sugary Drinks and Healthy Food and supported 'Less Sugar' campaigns following the 2023 workshop.[23]

08 WHAT THIS POINTS TOWARD

India's OHO data describe a population where oral health awareness is high, but **access remains the binding constraint**. Disease burden, particularly caries, tobacco-related lesions, and mobile teeth indicating advanced periodontal disease, reflects structural gaps rather than behavioural failure. The findings are consistent with a care system that partially reaches urban, private-sector patients but leaves significant portions of the population, including rural communities, children, and lower-income groups, underserved. Priorities supported by the evidence include integrating **oral health into primary care, targeted smokeless tobacco interventions, school oral health programming, and using OHO as an ongoing platform to monitor access and equity gaps across the care pathway.**

Sources: OHO Dataset India as analysed by Triangulate Health[27] validated through NDA consultation.[34] Published sources: Narang et al.[17]; Taylor et al.[9]; Broomhead et al.[11]; Singh and Purohit.[32,33]

LEBANON

798
adult patients

01 COUNTRY CONTEXT & SAMPLE PROFILE

Lebanon has historically had a strong private dental sector and relatively high access to restorative care, but the 2019 economic crisis severely strained affordability and financial protection for dental treatment.[16] Data collection was initiated in June 2019 under the Lebanese NDA across five provinces, with 26 dentists participating. The dataset (N=798 adults) therefore captures the oral health status of the treatment-seeking population at the onset of the economic crisis.

02 ACCESS INDICATORS

1.3%	65.5%	63.9%	74.0%	10.2%
Never seen a dentist	Last visit < 1 year	Regular patients	No reimbursement	Travel > 1 hour

Access indicators in Lebanon present a dual picture. On one hand, the majority of patients were regular attenders (63.9%) and 65.5% had visited within the past year, reflecting Lebanon's historically functional private dental sector. Most patients (53.2%) obtained an appointment within 24 hours. On the other hand, 74.0% of patients who answered the reimbursement question reported no reimbursement. Combined with the broader economic crisis context, this points toward a system under financial stress: the restorative infrastructure exists, but access to it is increasingly contingent on out-of-pocket payment.

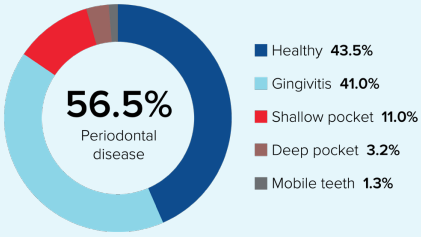
03 DISEASE BURDEN

CARIES, TREATMENT & TOOTH LOSS (ADULTS)

Inverted treatment gap 0.56 : 1 representing nearly two fillings for every carious tooth.

Lebanon has a favourable treatment gap ratio, with a mean of **6.6 filled teeth per patient against 3.7 carious teeth. 72.6% of patients had at least one carious tooth**, but 85.3% had at least one filling, indicating broad prior access to restorative care.

PERIODONTAL STATUS (ADULTS)



Periodontal disease is the defining unmet need in Lebanon's oral health system. Despite a functioning restorative sector, over half of patients present with active periodontal disease. This pattern is consistent with a care model oriented toward episodic restorative treatment rather than ongoing chronic disease management.

04 PATIENT-REPORTED ORAL HEALTH OUTCOMES

46.6%	35.2%	41.0%	6.2%
Oral pain	Difficulty eating	Bleeding gums	Working adults missed work (mean 5.7 days)

46.6% of patients reported oral pain in the past 12 months, and 35.2% had difficulty eating. 33.4% of patients experienced life felt less satisfying due to oral health problems, and 11.3% reported that oral appearance affected their ability to interview for a job. 6.2% of working adults reported missing work due to oral health conditions.

05 BEHAVIOURS & RISK FACTORS

PROTECTIVE FACTORS

84.3%	89.7%	63.1%
Fluoride toothpaste	Brush ≥1x daily	Brush ≥2x daily

RISK EXPOSURES

45.2%	15.4%	29.2%
Any tobacco use	Shisha users	Cigarette smokers

Oral hygiene practices are well established: 84.3% use fluoride toothpaste and 63.1% brush at least twice daily. These habits have not, however, prevented widespread periodontal disease, pointing toward the need for professional periodontal management as a complement to home care.

Tobacco use is the most significant modifiable risk factor. 45.2% of patients are current tobacco users, encompassing cigarette smoking (29.2%) and shisha use (15.4%). Lebanon's shisha culture is a distinctive feature of the risk profile not seen in most other OHO countries: shisha tobacco carries direct periodontal and oral mucosal risks and is likely a contributor to the high gingivitis prevalence.

06 KEY FINDINGS

1. RESTORATIVE CARE FUNCTIONS

The 0.56:1 inverted treatment gap reflects strong historical access to fillings. However, 56.5% of patients have active periodontal disease. The clinical priority is a reorientation toward periodontal management and chronic disease prevention, rather than episodic restorative care.

2. TOBACCO IS A MAJOR AND DISTINCTIVE RISK FACTOR

45.2% are current tobacco users, including 15.4% shisha users. Shisha carries specific periodontal and oral mucosal risks. Both forms are directly linked to the observed periodontal burden.

3. FINANCIAL PROTECTION IS ERODING AT A CRITICAL MOMENT

74.0% of those who answered report no reimbursement, and the economic crisis has further reduced access to private dental care. If restorative capacity is not matched by financial protection, the favourable treatment gap ratio may deteriorate in future data collection rounds.

4. OHO DATA TRANSLATED DIRECTLY INTO NATIONAL POLICY

Lebanon is the strongest policy translation case in the OHO programme at time of this report. OHO data were used to directly inform the Lebanese Strategy for Oral Health, finalised in June 2025 and endorsed by the FDI Council. This is an exemplary use of OHO data.

07 DATA COLLECTION & NDA EXPERIENCE FROM THE LEBANESE DENTAL ASSOCIATION

Programme value
The LDA considers OHO the most comprehensive oral health dataset available in Lebanon to date. OHO findings were compiled into a national results brief and used to facilitate an LDA workshop that directly informed the Lebanese Strategy for Oral Health (2025), structured around five GOHAP-aligned objectives. The LDA has also proposed establishing a formal dental office within the Ministry of Public Health to strengthen coordination.

Implementation experience
Data collection was conducted across five provinces between June 2019 and early 2020, with a pause in early 2020 due to the COVID-19 pandemic and the concurrent onset of Lebanon's economic crisis. The dataset therefore reflects a specific historical moment, which both enhances and constrains its interpretability. The Daou et al.[16] publication represents the first peer-reviewed analysis of the Lebanon OHO data and employed structural equation modelling to map pathways between demographic factors, behaviours, and oral and general health outcomes.

LDA advocacy priorities and OHO alignment
Lebanon's 2025 Oral Health Strategy is the clearest policy translation of OHO data, explicitly adopting its digital data model for a national system. OHO evidence also supports LDA priorities on periodontal disease and tobacco, sugar reduction, and financial protection, and underpins the proposal for a permanent dental office within the Ministry of Public Health.

08 WHAT THIS POINTS TOWARD

Lebanon's OHO data tell a story of a dental system that has functioned historically well but faces compounding threats. The restorative care model is effective where accessed, yet **periodontal disease affects over half the treatment-seeking population**, driven by tobacco exposure and insufficient preventive care. The economic crisis adds urgency as out-of-pocket costs rise, and insurance coverage remains limited. The national strategy now provides a framework for action; the immediate priorities are **periodontal integration into routine care, tobacco and sugar policy**, and using OHO as the data backbone for Lebanon's emerging national oral health information system.

Sources: OHO Dataset Lebanon as analysed by Triangulate Health[28] validated through NDA consultation.[28] Published sources: Taylor et al.[9]; Broomhead et al.[11]; Daou et al.[16]

TANZANIA

875
adult patients

01 COUNTRY CONTEXT & SAMPLE PROFILE

Tanzania faces a substantial and predominantly urban oral disease burden concentrated in a treatment-seeking population characterised by significant structural barriers: limited insurance coverage, geographic distance to care, and workforce constraints. Dental caries and periodontal disease are the leading conditions, making the OHO dataset among the most granular point-of-care evidence available in-country. The OHO Tanzania dataset (n=875 adults; n=150 children; 2021–2022; 21 clinics) is the first systematic, practice-based oral health data collection exercise carried out through the Tanzania Dental Association (TDA).

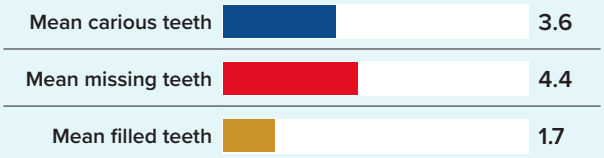
02 ACCESS INDICATORS

16.3%	45.7%	23.0%	32.6%	6.5%
Never seen a dentist	Emergency presentation	Travel > 1 hour	Last visit < 1 year	Check-up visit only

The access picture reflects a predominantly reactive care system. Nearly half of all presentations (45.7%) were for emergency treatment, and check-up visits accounted for just 6.5%. Only 30.1% were regular patients, 59.4% had no dental insurance, and 23.0% travelled more than one hour to reach care. Finally, 16.3% had never previously seen a dentist.

03 DISEASE BURDEN

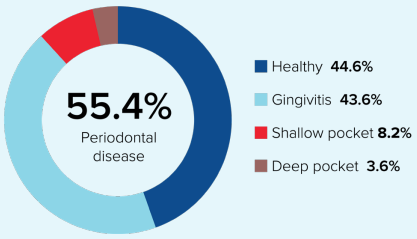
CARIES, TREATMENT & TOOTH LOSS (ADULTS)



Treatment gap ratio 2.2 : 1 for every filled tooth, more than two carious teeth remain untreated.

The 2.2:1 treatment gap with a mean of only 1.7 filled teeth per patient indicate that the restorative care system is reaching a small fraction of the treatment need. The high mean missing teeth figure (4.4) further reflects cumulative untreated disease over time.

PERIODONTAL STATUS (ADULTS)



55.4% of adults had some form of periodontal disease, comprising gingivitis (43.6%), shallow pockets 4–5 mm (8.2%), and deep pockets >6 mm (3.6%). 44.6% were periodontally healthy. Gingivitis dominates the periodontal profile (43.6%), suggesting that a significant proportion of the disease burden may be at a reversible or manageable stage if professional care is accessible.

04 PATIENT-REPORTED ORAL HEALTH OUTCOMES

70.5%	73.3%	64.6%	28.7%
Oral pain	Difficulty eating	Sleep disrupted	Working adults missed work **(mean 18 days)**

In the Tanzania OHO dataset, 70.5% reported oral pain and 73.3% difficulty eating in the past 12 months. Sleep disruption was reported by 64.6%. Many working adults (~29%) missed work due to oral health conditions.

05 BEHAVIOURS & RISK FACTORS

PROTECTIVE FACTORS

95.1%	46.0%	75.8%
Fluoride toothpaste	Brush ≥2x daily	Never drink alcohol

RISK EXPOSURES

6.4%	2.7%	70%
Current smokers	Other tobacco use	Daily consumption of sugar

Tanzania's behavioural profile presents what may be described as a protective-behaviour paradox: 95.1% of adults use fluoride toothpaste and tobacco use is low (6.4% smokers), yet oral pain affects 70.5% and the treatment gap ratio stands at 2.2:1. This pattern is consistent with structural access barriers, such as workforce scarcity, geographic distance, and absent financial protection, rather than individual behaviour failure being the primary driver of disease burden. Dietary frequency data suggest high exposure to sugary foods and beverages (approximately 70% of adults reported daily consumption of sugary beverages and over 50% reported daily sugary food consumption) though the instrument does not capture specific items or quantities, limiting the precision of sugar intake estimates.

06 KEY FINDINGS

1. STRUCTURAL BARRIERS, NOT BEHAVIOUR, DRIVE THE BURDEN

95.1% use fluoride toothpaste and tobacco use is low, yet 70.5% experience oral pain. The binding constraints are workforce scarcity, geographic distance, and the absence of financial protection rather than individual hygiene practices.

2. THE CARE SYSTEM IS ALMOST ENTIRELY REACTIVE

45.7% emergency presentations, 6.5% check-up visits, 30.1% regular patients. This reflects a system responding to acute need rather than managing disease preventively.

3. QUALITY-OF-LIFE BURDEN IS HIGH

70.5% oral pain, 73.3% difficulty eating, 64.6% sleep disrupted. These findings represent a measurable, daily functional burden affecting productivity and wellbeing.

4. CHILDREN FACE EVEN GREATER ACCESS BARRIERS

48.5% of children had never seen a dentist, compared to 16.3% of adults. Early unmet need of this scale is consistent with the adult disease pattern and points toward the need for school-based oral health.

07 DATA COLLECTION & NDA EXPERIENCE FROM THE TANZANIA DENTAL ASSOCIATION

Programme value

The TDA considers OHO a valuable initiative that has generated the most detailed point-of-care oral health evidence currently available in Tanzania. The TDA has proposed aligning OHO clinical indicators with the national DHIS2 system for real-time monitoring, which may present as a potential model for OHO-to-national-surveillance integration.

Implementation experience

Data collection was conducted across 21 clinics between 2021 and 2022, during Tanzania's post-COVID recovery period. The TDA coordinated data collection with limited central resource, managing clinic recruitment, ethical approval, and practitioner training. The predominantly public-sector clinic base reflects the structure of dental care in Tanzania but may limit generalisability to private practice populations. The small denominator for filled teeth (n=340) reflects the reality that many patients had no fillings, which itself is a substantive finding about restorative care access rather than a data quality issue.

TDA advocacy priorities and OHO alignment

OHO data have supported TDA advocacy in several areas: sugar-sweetened beverage taxation (linking high caries burden with the need for structural sugar policy); expanded dental coverage under the Universal Health Insurance scheme (access and treatment gap data); and integration of oral health into primary care (demonstrating feasibility of routine data collection and unmet need). The TDA has also recommended CPD accreditation for OHO training, local data access for clinics, and policy briefs as priority outputs for the next round.

08 WHAT THIS POINTS TOWARD

Tanzania's OHO data make a case not for behaviour change but for **system strengthening**. Protective behaviours are already strong in the sample, yet over 70% present with oral pain. The binding constraints are structural: workforce shortage, geographic distance, and absent financial protection. Policy action could focus on **integrating oral health into primary care, expanding financial protection under the UHI**, and using OHO data to anchor Tanzania's first dedicated national oral health policy. The TDA's proposed DHIS2 integration represents a practical pathway toward real-time national surveillance.

Sources: OHO Dataset Tanzania as analysed by Triangulate Health[29] validated through NDA consultation.[35] Internal document provided by FDI: Advocacy activities by Tanzania Dental Association.[20]

VI. DISCUSSION AND IMPLICATIONS OF OHO'S WORK

WHAT THE OHO DATA SHOW ACROSS COUNTRIES

Across the five country profiles, a consistent pattern emerges. Oral disease burden is high across settings, but the systems responding to that burden differ significantly in structure and effectiveness.

The dominant conditions observed across countries (caries, periodontal disease) are chronic in nature, consistent with global evidence showing that untreated caries and periodontal disease remain among the most prevalent non-communicable conditions worldwide.[1] Moreover, patient-reported oral health outcomes indicated oral conditions have considerable impacts on the daily life of people. However, **the organisation of care reflected in OHO data remains largely episodic and treatment-oriented, with limited evidence of systematic prevention or structured long-term disease management.** This pattern mirrors what has been described elsewhere as a treatment-dominated model that has failed to address the underlying determinants of oral disease, particularly in LMIC contexts.[36]

This misalignment between disease profile and system response is visible in different forms. In Tanzania, access constraints result in a predominantly reactive system characterised by emergency attendance, large treatment gaps, and high levels of oral impacts. India reflects a transitional system, with evidence of restorative care but continued late presentation and unmet need. Lebanon shows a historically functional system under increasing financial strain, with emerging barriers affecting continuity of care. In China, relatively strong hygiene behaviours coexist with substantial periodontal disease, indicating that behavioural factors alone are insufficient without sustained professional care. Colombia presents a contrasting case with private-sector access and restorative care functioning relatively well, yet comparison with national survey data highlights substantial inequities between those who reach care and those who do not.[16,19] Taken together, these findings suggest that **variation across countries lies less in the type and burden of oral diseases and more in how systems respond to that burden.**

A further consistent finding is that **individual behaviour is not the primary constraint** on outcomes. Across multiple countries, reported oral hygiene practices and awareness are relatively well established, yet disease burden remains high. This supports wider evidence that oral health outcomes are shaped not only by compliance behaviour, but by system-level factors including access to care, financial protection, and workforce distribution.[37,38] A recent scoping review of dental care utilisation in LMICs found that structural and economic barriers, rather than behavioural factors, were the most frequently reported determinants of access, with cost identified as the primary driver of unmet need.[37]

THREE SYSTEM-LEVEL FINDINGS

1

There is a gap between the chronic nature of oral disease and the way care is delivered. Across all countries, care pathways appear to be driven more by episodes of need than by structured prevention or long-term management. In Tanzania this is visible through high levels of emergency care, in India through late-stage treatment, and in Lebanon through disruptions to continuity of care. Even in settings where access is stronger, such as Colombia's private sector, care remains predominantly treatment-focused.[35,37]

2

Differences in outcomes across countries appear to be driven more by access to care than by differences in behaviour. While self-reported behaviours vary, they do not map consistently onto outcomes. Countries with relatively strong self-reported hygiene practices do not necessarily exhibit lower disease burden, though it should be noted that self-reported data may not fully reflect actual behaviour. Despite this, countries with poorer outcomes are arguably characterised by structural barriers, including cost, service availability, and workforce maldistribution.[37–39] This suggests that improvements in oral health outcomes will depend primarily on strengthening systems of care alongside ensuring that preventative behaviours are not only reported but effectively practised.

3

The data also highlight the broader impact of oral conditions beyond clinical status, particularly in terms of daily functioning and economic burden. Across countries, reported pain, difficulty eating, and disruption to work and daily activities indicate that oral disease is both prevalent and functionally limiting. All five countries presented as case studies record missed workdays due to oral health problems, with the prevalence and severity of work loss tracking closely with structural access barriers. In Tanzania, 28.7% of working adults reported missing work, with a mean of 18 days lost per affected worker. In India, 14.3% missed work with a mean of 10 days lost, while China recorded 18.8% prevalence and 4.3 mean days lost. Colombia (8.1%, 3.5 days) and Lebanon (6.2%, 5.7 days) showed lower prevalence but still meaningful productivity effects. These findings are consistent with global estimates of a high total economic burden of oral conditions (at approximately US$710 billion in treatment costs and productivity losses annually) of which nearly half comprised of productivity losses.[40–42] Studies at the population level similarly document that oral conditions account for a substantial proportion of sickness-related work absence and presenteeism among adults.[41] Taken together, these findings affirm that the burden of oral disease extends well beyond clinical outcomes to encompass economic and social outcomes.

WHERE OHO IS CREATING IMPACT

Across the programme, the value of the OHO lies less in the existence of a dataset and more in how that dataset is positioned within the oral health system.

At a foundational level, OHO demonstrates that it is possible to generate standardised, internationally comparable oral health data across diverse country contexts using a common framework. The alignment with the FDI–ICHOM Adult Oral Health Standard Set allows clinical status, behavioural risk factors and patient-reported oral health outcomes to be captured in a consistent way, in accordance with the direction set out in the WHO Global Oral Health Action Plan. In practice, this creates a dataset that is directly relevant to current global priorities, particularly the shift toward prevention, patient-centred outcomes and stronger oral health information and surveillance systems.

The programme has also established a functioning model for knowledge generation and exchange. Across countries, OHO has supported peer-reviewed research, country-level analyses and structured workshops involving national dental associations, ministries of health and academic partners. These activities demonstrate that the programme is not operating in isolation but is already embedded within professional and policy networks. Looking ahead, FDI plans to convene an OHO Summit at the World Dental Congress 2027 in Mumbai, bringing together participating countries, WHO, policymakers and Chief Dental Officers. Furthermore, full scientific access to the OHO datasets is also under discussion. This signals a deliberate shift from data generation to collective action. By convening decision-makers on a shared evidence base, the Summit creates a structured opportunity to translate ten years of OHO findings into coordinated policy commitments at the national and global level.

THE PATH FORWARD: OPPORTUNITIES FOR OHO'S SECOND DECADE

Taken together, these patterns suggest that OHO has established a functioning model for generating and using oral health data across countries, but that its full potential now depends on how it is positioned within policy processes and health systems. Some opportunities are illustrated in Table 7.

Table 7: Opportunities for OHO.

Area	Opportunity	Rationale
Global integration	Stronger alignment with GOHAP monitoring framework and WHO Global Oral Health Status Report.	*OHO domains map onto GOHAP priorities; formal integration would fill surveillance gaps in LMICs where national surveys are absent.*
Policy translation	Systematise NDA–Ministry of Health engagement and produce policy-facing outputs for each country.	*Lebanon demonstrates the model works; India and Colombia show momentum; Tanzania and China have the data but not yet the policy pathway.*
Population representation	Extend data collection beyond dental clinics to community and primary care settings.	*Current treatment-seeking samples exclude the highest-burden populations; community-based modules would address this.*
System integration	Link OHO data with national health information systems (e.g. DHIS2).	*Would enable OHO indicators to feed into routine surveillance and strengthen institutional ownership.*
Analytical development	Support advanced multilevel modelling and within-country equity analyses.	*Broomhead et al.[11] demonstrated this is feasible and extension to other countries would deepen the evidence base.*

VII. CONCLUSION

Over the past decade, OHO has demonstrated that standardised, practice-based oral health data collection is feasible across diverse country contexts.

The programme has successfully evolved from a data collection mechanism into a platform for research and peer learning. The country profiles in this report demonstrate the depth of insight that OHO data can provide. The next stage of development will depend on whether OHO can transition from a data generation platform to a system-integrated, policy-relevant tool. Achieving this will require stronger alignment with WHO frameworks, more consistent policy engagement at country level, expanded efforts to address representativeness and equity gaps, and sustained investment in the analytical and institutional infrastructure that turns data into action.

OHO is well positioned to contribute meaningfully to this agenda as a strong complementary, practice-based data source that connects the global evidence base to what is happening in dental clinics, in real time, across the world.

OHO has the potential to play a significant and distinctive role in strengthening oral health systems and advancing global oral health priorities in the decade ahead.

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