Guidance on the analysis and use of routine health information systems: eye and ear care module

World Health Organization

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Contents

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Background

The global need for eye and ear care is projected to increase dramatically in the coming decades associated with demographic, behavioural and lifestyle trends. In addition, the rise in the number of noncommunicable eye and ear conditions poses a considerable challenge to health systems. To accentuate these challenges, significant inequalities exist in accessing these services and the burden of vision impairment and hearing loss being greater in low- and middle-income countries and underserved populations. Strengthening eye and ear care in health systems, by implementing integrated people-centred eye, ear and hearing care, is fundamental to respond to the increasing demand and to ensure the availability and affordability of services for those in need. Key recommendations to strengthen eye and ear care in health systems, described in both the *World report on vision* and *World report on hearing*, are to monitor trends and evaluate progress by collecting data relevant to eye and ear care included in countries' national health information systems (HIS) *(1, 2)*.

Routine data collected from health facilities on eye and ear care, provide information on morbidity, estimates of services utilization, and quality and coverage of services, to allow management and clinical decision-making. Analysis of data on the distribution, availability and coverage of eye and ear and hearing care services at national and subnational level informs national planning and decision-making in health policy, management, and clinical care. This information will further help to monitor progress towards achieving universal health coverage (UHC).

Using this guidance document

What is the purpose of this guidance document?

In their work towards achieving the UHC targets and the Sustainable Development Goals, countries need reliable data to assess the performance of their health services. This guidance aims to facilitate the monitoring of both eye and ear care services through presenting a set of core facility indicators along with considerations for analysis and use of routine health information.

The WHO reporting frameworks, the *Eye care indicator menu* and *Ear and hearing care: indicators for monitoring provision of services*, served as bases for the selection of indicators recommended for routine collection at facility level and collated through District Health Management Information Systems (DHMIS). Indicators from both frameworks were selected, based on the need for facility level reporting in order to populate the indicators *(3, 4)*.

Eye and ear care services are provided at all levels of care by a multidisciplinary workforce and cover a wide range of interventions. Understanding the burden that data collection may represent at facility level, the selected set of indicators focuses on eye and ear care interventions most commonly provided at secondary and tertiary levels of care.

Who are the intended users of this guidance document?

The core facility indicators set is intended to be used by decision-makers in eye and ear care, programme managers/planners, facility managers and services providers to inform the data that are collected.

Analysis of the data provided through routine collection and reporting from facilities can involve:

- national/subnational health authorities and decision-makers at the Ministry of Health;
- eye and ear care programme managers, planners, and partners;
- eye and ear care data analysts and health information systems managers;
- eye and ear care service managers at health-care facilities; and
- research institutes involved with the investigation of eye and ear care services and information systems.

What are the expected outcomes?

The indicators aim to support the integration of eye and ear care data into the facility level reporting system. The data provided inform the analysis, monitoring and evaluation processes to support planning and decision-making.

The set of indicators allows service utilization to be measured over time, and provides information on morbidity, patterns of quality for interventions, coverage of interventions, and workforce distribution. In addition, the indicators can be used to track progress towards the objectives of an operational and/or strategic plan. They are designed to answer monitoring and evaluation questions on eye and ear care, such as:

- What geographical areas have the highest/lowest density of eye/ear care workers?
- What are the most common eye/ear conditions presenting at facilities, and what level of impairment do they cause?
- How are eye and ear care services contributing to universal health coverage?
- How effective is the treatment of eye/ear conditions?
- What is the change in treatment outcomes over time?
- To what extent do people in need of eye and ear care interventions have access to quality care?
- What is the coverage gap for eye/ear screening in newborns?

Core facility indicators for sensory functions

The core facility indicators for both eye care and ear and hearing care are set out in tables 1 and 2 below.

Table 1. Core facility indicators for eye care

Core indicator	Definition	Disaggregation
Eye care workforce density and distribution	Number of eye care workers/ Total population x 10 000	1. Profession[1] 2. Geographical region
Eye care service use distribution	Number of first visits to eye care services for selected eye conditions category/ Total number of first visits to eye care services x 100	1. Selected eye conditions category[1] 2. Age (0–17 yrs; 18–49 yrs; ≥50 yrs) 3. Vision status[1]
Waiting time for cataract surgery	Sum of the waiting days[1] for cataract surgery/ Total number of cataract surgeries	1. Geographical region
Cataract surgery preoperative vision status	Number of cataract operated eyes with selected preoperative visual acuity category/ Total number of cataract surgeries x 100	1. Preoperative presenting visual acuity category[1]
Cataract surgical outcome	Number of cataract operated eyes with selected postoperative visual acuity category/ Total number of cataract surgeries x 100	1. Postoperative presenting visual acuity category[1]
Diabetic retinopathy screening	Number of people screened for diabetic retinopathy/ Total number of people referred for diabetic retinopathy screening x 100	
Newborn screening for congenital and neonatal eye conditions	Number of newborns screened for congenital and neonatal eye conditions in the first month of life/ Total number of live births x 100	1. Screening result (Passed *vs* Failed) 2. Geographical region
Access to screening for retinopathy for prematurity (ROP)	Number of eligible infants[1] screened for retinopathy of prematurity/ Total number of infants eligible for ROP screening who are admitted to neonatal intensive care x 100	1. Screening result type (ROP diagnosis or not)

[1] For more detailed information, see Annex. Brief definitions

Table 2. Core facility indicators for ear and hearing care

Core indicator	Definition	Disaggregation
Ear and hearing care workforce density and distribution	Number of ear and hearing care workers/ Total estimated population x 10 000	1. Profession[1] 2. Geographical region
Ear and hearing care service use distribution	Number of first visits to ear and hearing care services for selected ear conditions category/ Total number of first visits to ear and hearing care services x 100	1. Selected ear conditions category[1] 2. Age (0–17 yrs; 18–49 yrs; ≥50 yrs)
Hearing loss diagnosis	Number of new diagnosis of hearing loss/ Total number of first visits to the ear and hearing care services x 100	1. Hearing loss degree[1] 2. Hearing loss type[1]
Access to hearing technologies[1]	Number of cases with hearing loss fitted with hearing technologies/ Total number of new diagnosis of hearing loss x 100	1. Hearing technology type
Follow-up after hearing technology fitting	Number of cases fitted with hearing technologies with at least 1 follow-up session within 6 months of fitting/ Total number of cases fitted with hearing technologies x 100	
Waiting time for surgery for middle ear cholesteatoma	Sum of the waiting days[1] for surgery for middle ear cholesteatoma/ Total number of middle ear cholesteatoma surgeries	1. Geographical region
Newborn screening for hearing loss	Number of newborns screened for hearing loss prior to discharge / Total number of live births	1. Screening result (Passed *vs* Failed) 2. Geographical region

[1] For more detailed information, see Annex. Brief definitions

Data quality

Data that are routinely collected from health facilities provide a primary data source to assess the performance of a country's health system. However, a major challenge with their use is that responsibility for data entry and management is distributed across many individuals and facilities. Therefore, as for all data sources, in addition to establishing systems and protocols to enhance good collection and reporting, the reported data should be checked and reviewed for quality before the analysis.

The *WHO data quality assurance toolkit (5)* provides guidance for defining measures of data quality, conducting a desk review to assess data quality, and conducting data verification of routine data from health facility systems. The metrics for the four domains used for the periodic assessments of data quality, as recommended by the toolkit, are summarized in Table 3 below.

Table 3: Routine data quality assurance

Domains	Data quality metric	Frequency
Completeness and timeliness	Completeness and timeliness of reporting (reporting form/data set completeness)	Monthly, annually
	Completeness of indicator data (data element completeness)	Monthly, annually
Internal consistency	Presence of outliers	Monthly, annually
	Consistency over time, i.e. plausibility of reported values compared to previous reporting	Monthly, annually
	Consistency between indicators	Annually
	Consistency between denominators, e.g. estimated number of new cases of vision impairment or hearing loss	Annually
External consistency with other data sources	Consistency between routinely-reported data and population-based surveys	Annual or Ad-hoc
External comparison of population data	Consistency between population data used for calculating rehabilitation coverages and other sources of population estimates	Annually

To assure data quality, other methods recommended by WHO should be applied periodically. WHO recommends that data quality should be reviewed routinely – at a minimum, monthly – and across all reporting levels, to align with the routine reporting cycle. Each country will adopt their own procedures for assuring data quality that are appropriate for their data flow, reporting frequency, and structure. However, the standard applied should address each of the domains as described above in Table 3.

Core analysis

Routinely collected data from health facilities on eye and ear care are used to measure workforce availability, service use, and access to interventions, as well as to monitor trends over time and assess the geographical differences among people attending eye and ear care services.

To facilitate the use and analysis of the information, the core facility indicators and the corresponding dashboards and visualizations[1] are organized according to each programme: "Eye care" or "Ear and hearing care".

1 The dashboards and visualizations presented in this document are screen captures taken from the DHIS2 digital package demo populated with "dummy" data. They are not intended to show real-time country data. The screen captures provided by the DHIS2 team contain a map of Lao People's Democratic Republic, reproduced with kind permission from the Ministry of Health. The use of "SF" in the screen captures refers to "sensory functions"; the use of "PHC": refers to "primary health care".

Eye care

For the purpose of data analysis, guidance has been organized for: the interpretation of workforce data; the interpretation of eye care data by facility managers; and the interpretation of eye care data by (sub)national decision-makers.

Eye care workforce

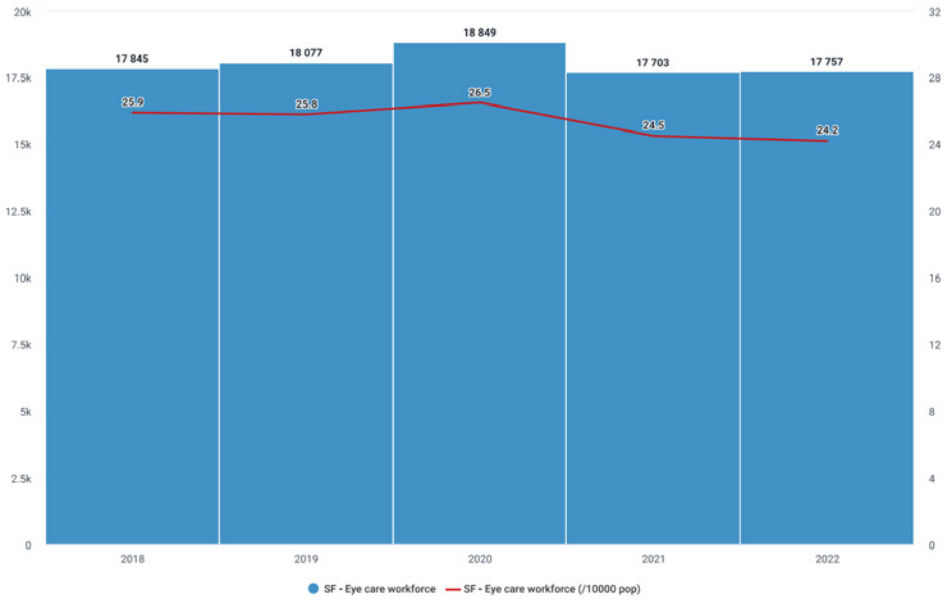
Indicator: *Eye care workforce density and distribution.*

Purpose: To provide information about the availability, composition and distribution of the human resources needed for essential eye care services provision. An indirect assessment of the quality of services can also be made. To allow comparability, the eye care professions selected correspond to those in the *WHO Eye Care Situation Analysis Tool (6).*

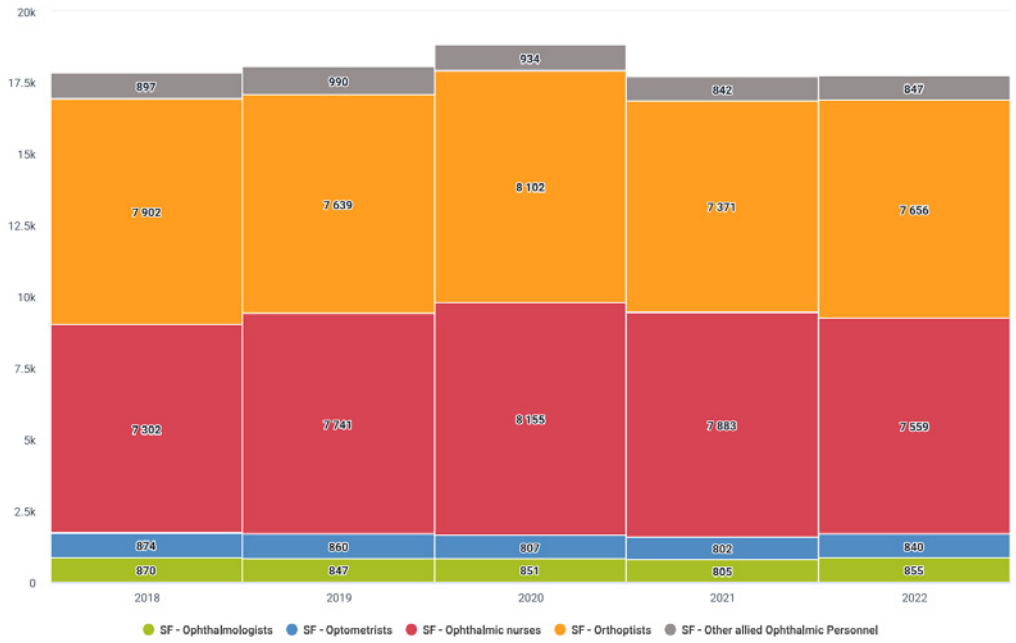
Visualizations and considerations for interpretation: In the field of eye care, there is no global recommended standard for workforce density in relation to the total population. However, the global shortage of eye care workers, especially in low-resource settings, is widely acknowledged *(1).* Adequate levels of workforce density depend on the context of each country, and recommendations should be made based on population needs at country level. This dashboard can be used to assess the total number of eye care workers and overall density (visualization 1), the number of different eye care professionals (visualization 2), and the respective densities of the different eye care professionals (visualization 3), over time and for a given geographical region.

Given the lack of global recommendations, health authorities and national programme managers can compare their data periodically with countries with similar socioeconomic backgrounds. Assessment of the availability of different professions indirectly informs the quality of the system for delivering eye care services. This information can be used at facility level, for service planning; and at subnational and national levels to identify shortages, allocate resources effectively, and to better distribute the workforce across health facilities or programmes to meet population needs.

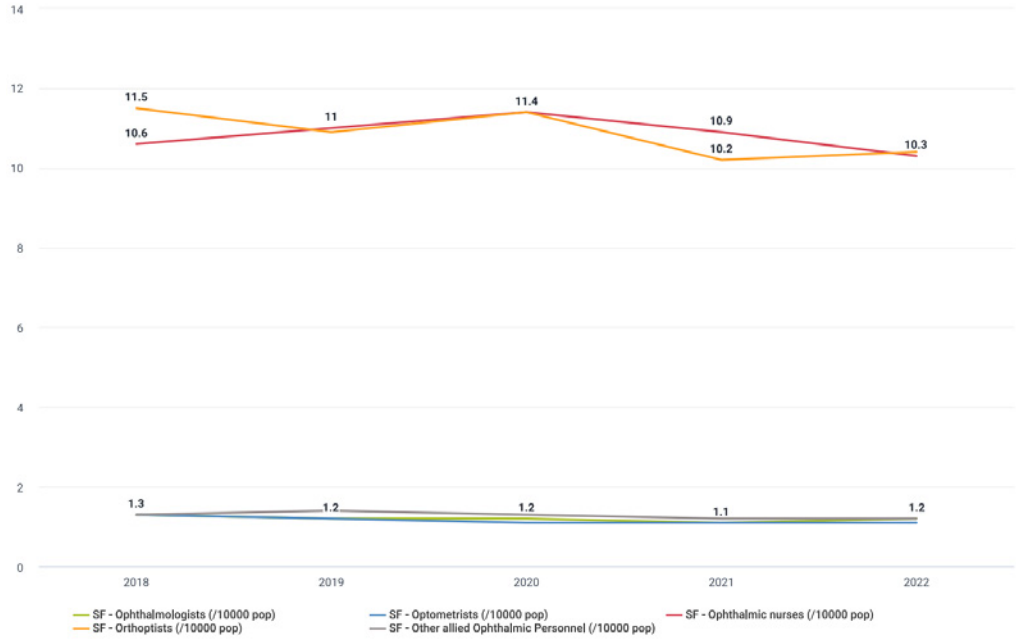
Visualization 1: Timeline of number of eye care workers and overall density, national, 2018 – 2022



Visualization 2: Timeline of number of eye care workers by profession, national, 2018 – 2022

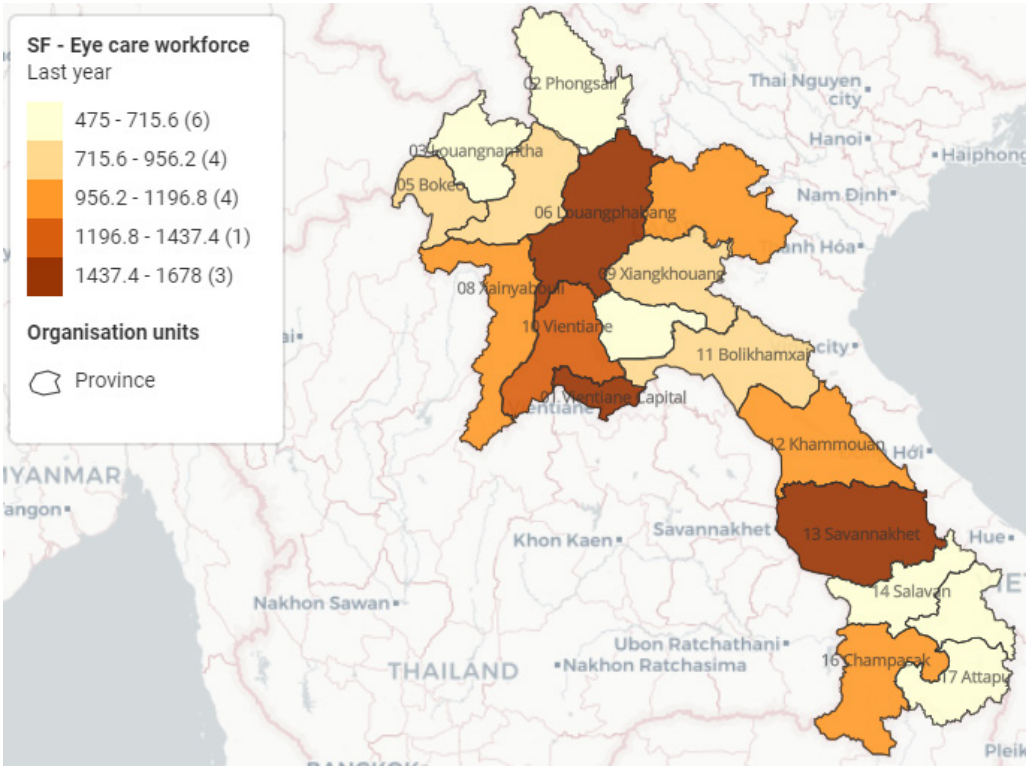


Visualization 3: Timeline of the density of eye care workers by profession, national, 2018 – 2022

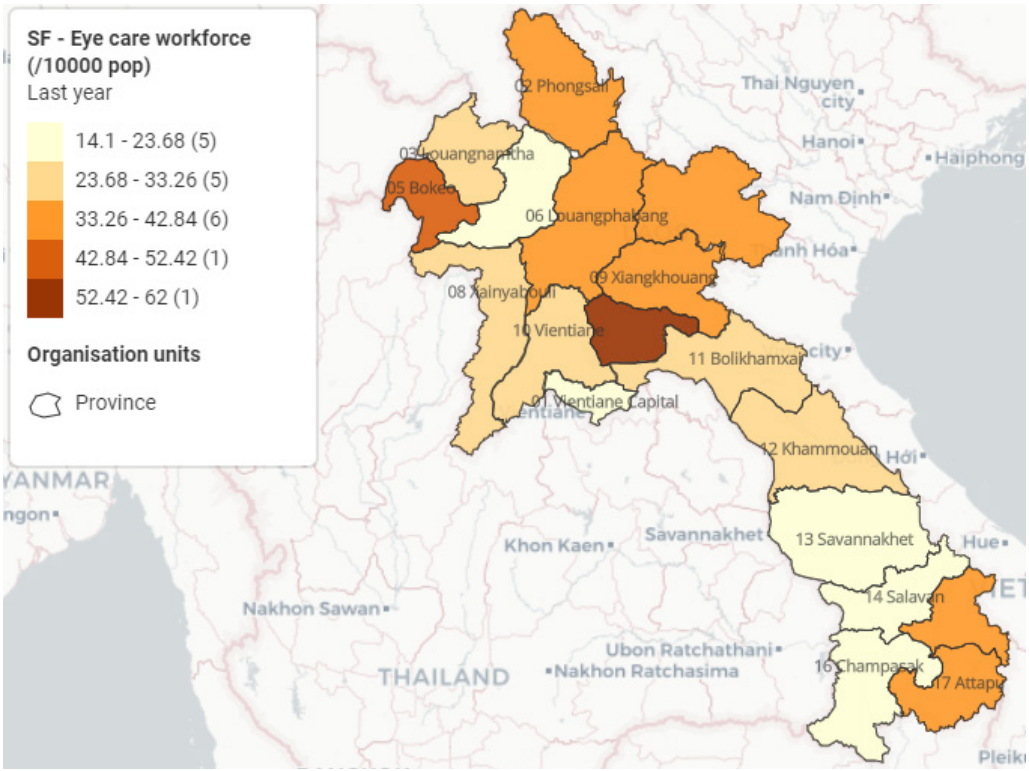


The dashboard can also be used to assess the distribution of the eye care workforce within the country in terms of absolute numbers or densities for given geographical regions. Visualizations 4 and 5 display a country map which uses colour coding to show the location of facilities, the number of eye care workers, and the workforce density for each district. In many countries, the availability of the eye care workforce is mainly concentrated in urban areas. These visualizations can be used to make an assessment of equal geographical distribution and a comparison of eye care workforce densities for given geographical regions.

Visualization 4: Number of eye care workers (total), by district, 2022



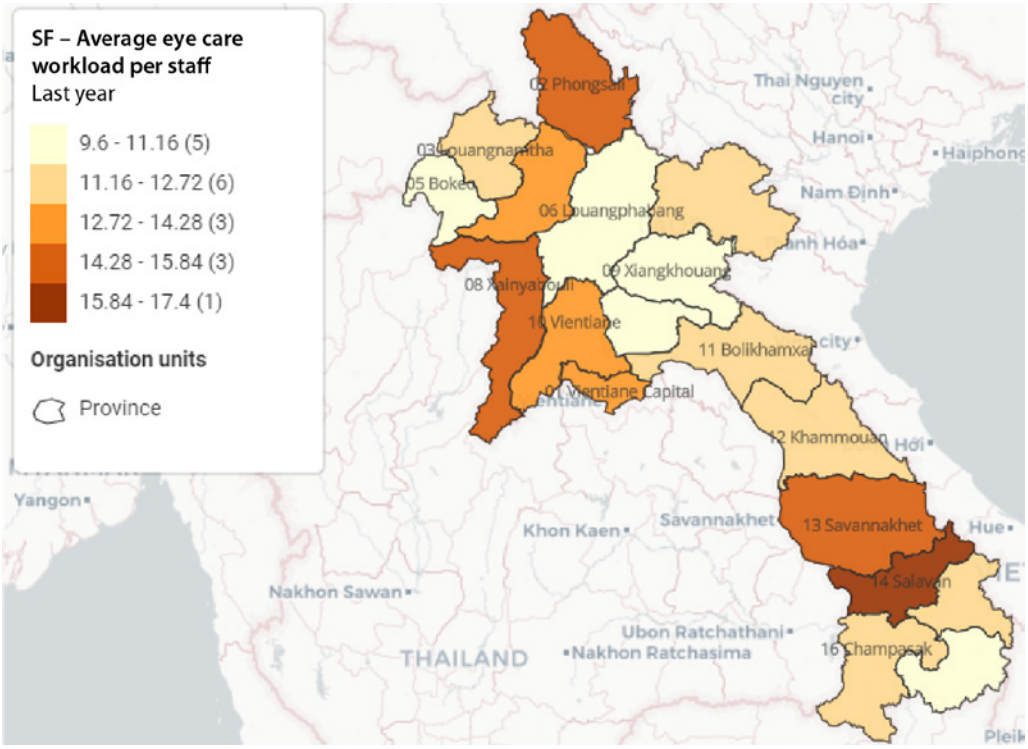
Visualization 5: Density of eye care workers (total), by district, 2022



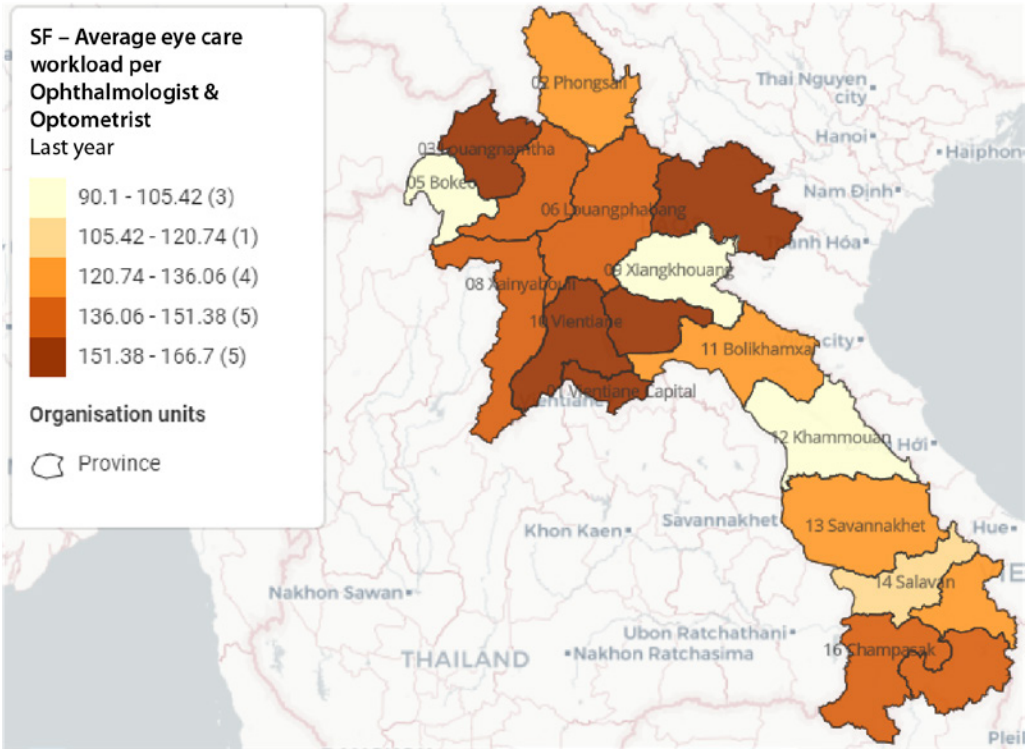
It is also possible to assess the average workload[1] per eye care worker (visualization 6) and the average workload per autonomous eye care worker (visualization 7). Eye care interventions often require a multidisciplinary workforce with a wide range of competencies; these are typically represented in the professions described. With full consideration for the variability of scopes of practice between countries, health authorities and national programme managers should adapt the profiles to those that best respond to the country's reality.

[1] For more detailed information, see Annex. Brief definitions.

Visualization 6: Average workload per eye care worker, by district, 2022



Visualization 7: Average workload for autonomous eye care workers (ophthalmologists and optometrists), by district, 2022



The dashboard allows an analysis of time trends of workforce density at national and subnational levels to establish the baseline and to monitor efforts towards achieving an equal distribution across regions. Health authorities and national programme managers may identify shortages or inconsistencies in the number of eye care workers and set their own national and subnational standards based on population needs.

Eye care – facility managers

A health facility level dashboard contains four sections: service use distribution; cataract surgery; diabetic retinopathy screening; and newborn screening.

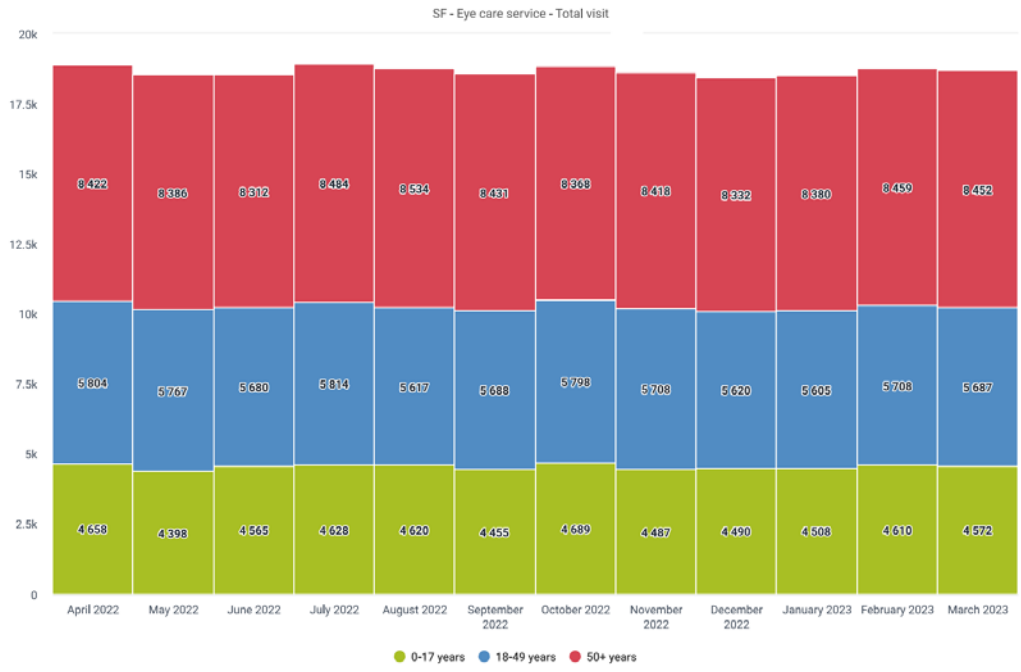
Service use distribution

Indicator: Eye care service use distribution.

Purpose: To provide information about the use of eye care services, expressed as the percentage of first visits for selected eye condition categories, disaggregated for vision status and age groups.

Visualizations and considerations for interpretation: The number of eye care visits at a facility reflects the capacity of the facility to respond to the population's needs (visualization 8). A visit is defined as an encounter, planned or not, with an eye care worker by a person who presents in the facility with an eye care need. This can include both "follow-up" visits (i.e. visits by clients who have been receiving eye care in previous reporting periods) and "first" visits (visits by clients who commence receiving eye care in the reporting period). The dataset distinguishes both "first" and "follow-up" visits. A disaggregation by defined age groups aims to monitor service use across these subpopulations. This allows mid- to long-term service planning that involves capacity-building measures.

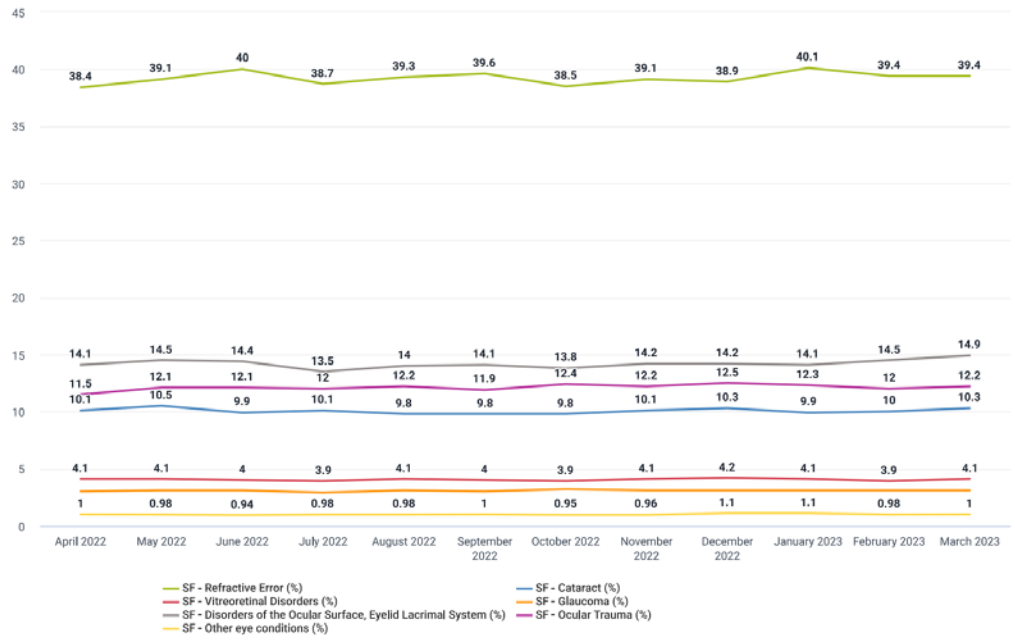
Visualization 8: Number of eye care visits for defined age groups, for selected facility, April 2022 – March 2023



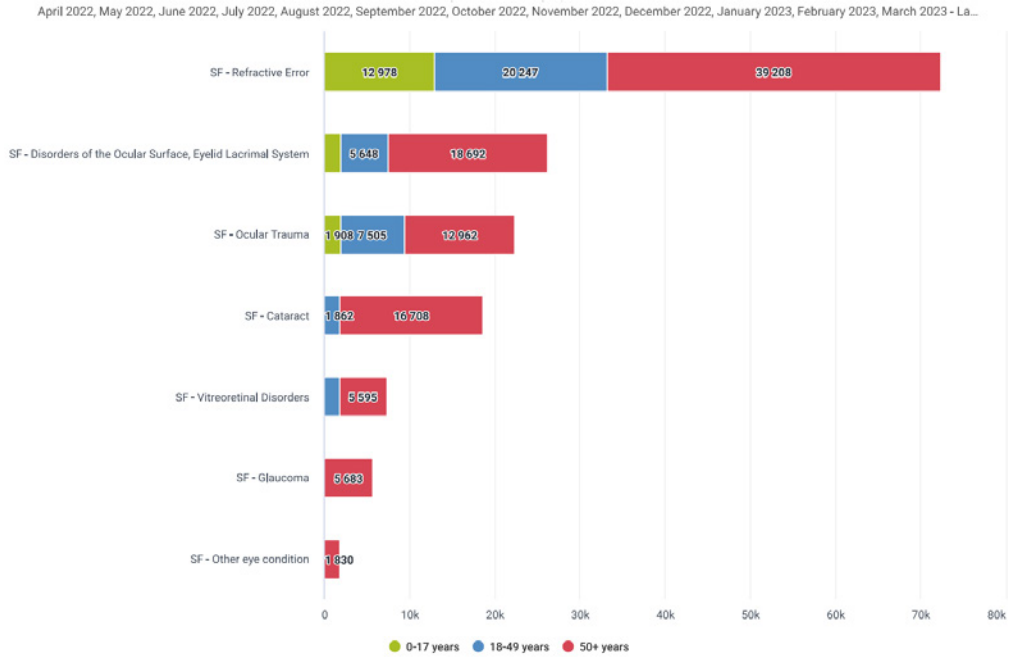
Data on the use of eye care services for specific categories of eye conditions (visualization 9) provide information on the availability of services for people with such conditions. The extent to which people can access and use eye care services affects the coverage of interventions. The distribution of first visits for specific eye conditions, and the disaggregation by age (visualizations 9 and 10), allow facility managers to plan according to service use trends and to develop capacity-building measures such as workforce requirements. In the short- and medium-

term, this information can be used for service planning (for example to allocate resources effectively, or to identify problems and needs); in the long-term, trends that affect service utilization and delivery can be identified, and the prevention of vision impairment and blindness planned accordingly.

Visualization 9: Distribution of the percentage of first visits for eye care services by eye conditions category, for selected facility, April 2022 – March 2023



Visualization 10: Number of first visits for defined eye condition categories, by age group, for selected facility, April 2022 – March 2023



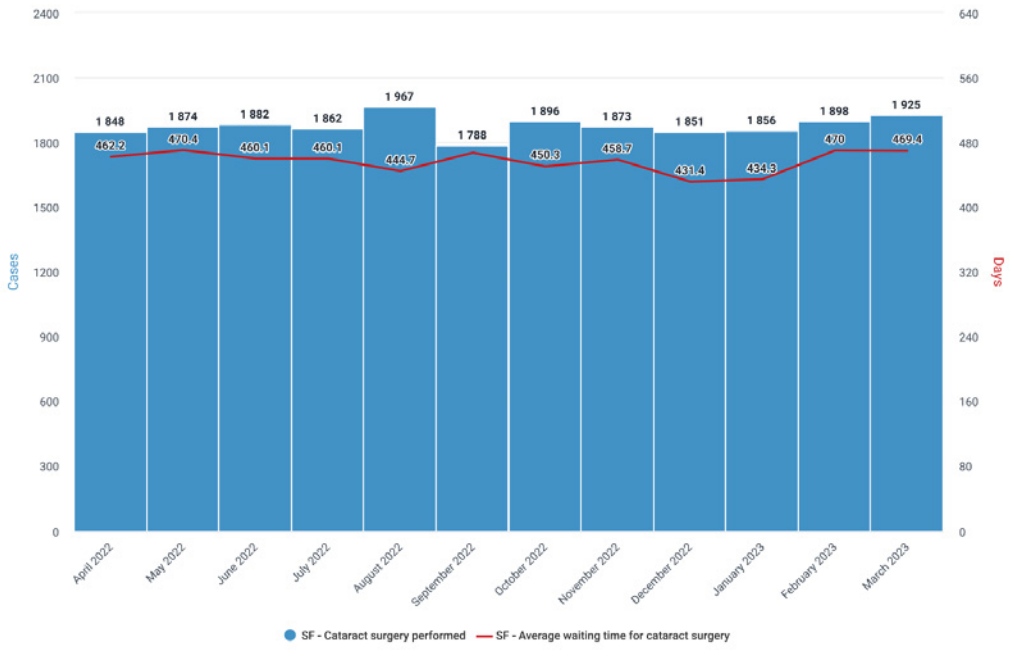
Cataract surgery

Indicators: Waiting time for cataract surgery; Cataract surgery preoperative vision status; and Cataract surgery outcome.

Purpose: To provide information on timely access of people in need of cataract surgery; and the vision status of the population that received cataract surgery.

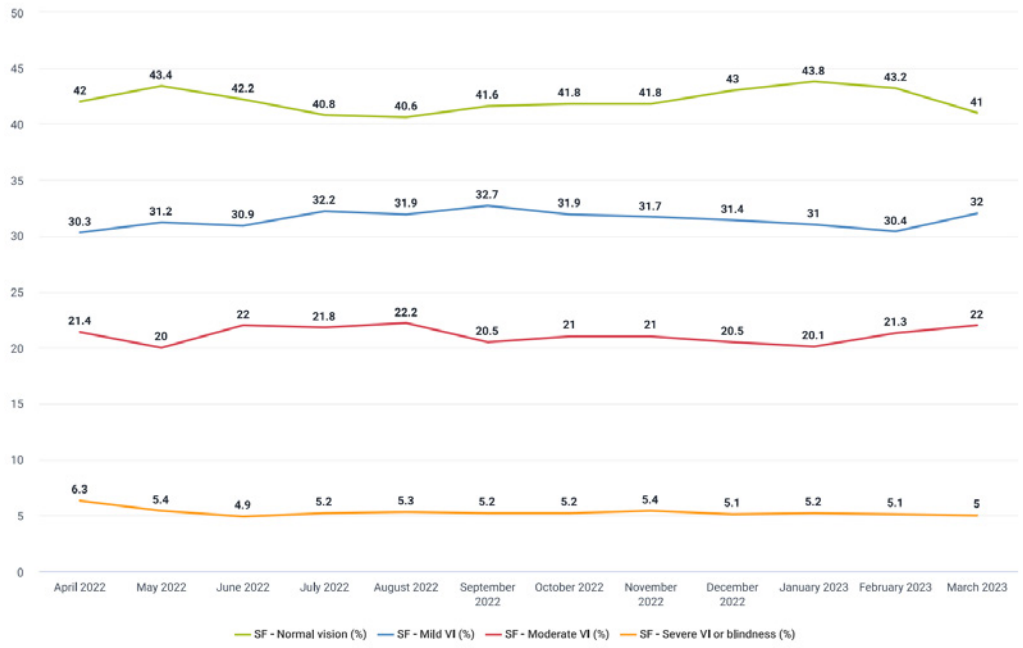
Visualizations and considerations for interpretation: Waiting time for cataract surgery is commonly used as an indicator for the timely provision of services to meet demand. Timely delivery of cataract surgery is critical to reduce the time a person has a vision impairment. Waiting times of people receiving cataract surgery can demonstrate potential barriers in accessing such surgery, including insufficient availability of services to meet demand. Excessive waiting times (from referral for surgery to the surgery itself) may be a symptom of inefficiencies in the health-care system and should be reduced in order to avoid deterioration of the health condition. Analysts are as well requested to verify whether waiting times are not increasing with increasing numbers of surgeries performed (visualization 11).

Visualization 11: Timeline of number of cataract operated eyes and waiting time for cataract surgery, for selected facility, April 2022 – March 2023



This information should be compared with preoperative vision status; inadequate availability of cataract surgical services is likely to be reflected by a greater proportion of people with very poor preoperative visual acuity (visualization 12). A reduction in the proportion of people who are blind or have severe vision impairment prior to receiving cataract surgery over time shows local progress made towards the availability of cataract surgical services and the decrease of vision impairment from cataract.

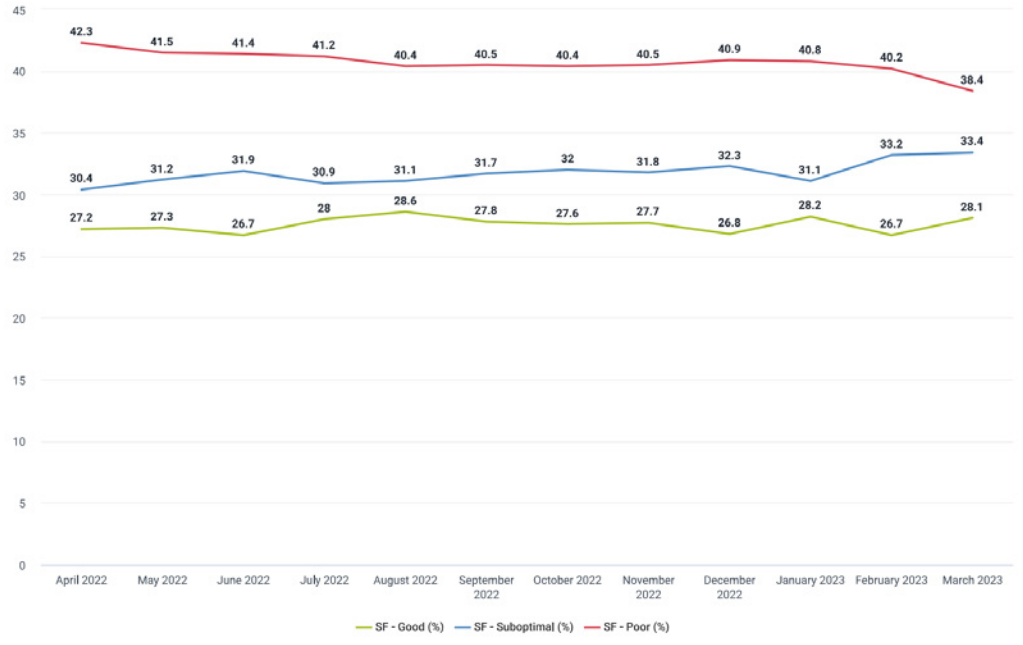
Visualization 12: Cataract surgery preoperative vision acuity, for selected facility, April 2022 – March 2023



The outcome of cataract surgery is crucial for monitoring the quality of the service and informing interventions to improve the quality, including surgeon retraining. Assessment of the postoperative vision status following cataract surgery (visualization 13) can identify potential causes of a poor outcome – for example, poor case selection, low quality of surgery and surgical complications, and postoperative complications, among other concerns – and prompt action to improve future results.

This information may be used by facility managers in the planning of cataract surgery services, identifying problems and needs, and improving referral systems, among other issues.

Visualization 13: Cataract surgery outcome, for selected facility, April 2022 – March 2023



Diabetic retinopathy screening

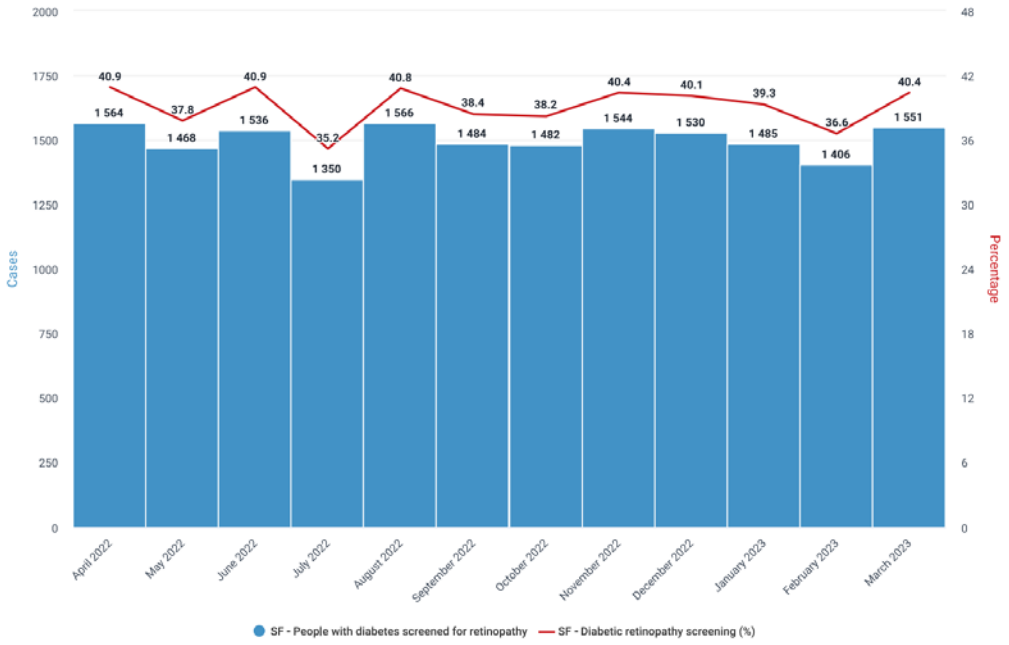
Indicator: Diabetic retinopathy screening

Purpose: To provide information about the percentage of people who have been referred for diabetic retinopathy screening who have actually received diabetic retinopathy screening at the recommended interval.

Visualizations and considerations for interpretation: Systematic retina screening in people with diabetes, and referral where indicated, is recommended to ensure early detection and timely treatment to avoid vision impairment caused by diabetic eye disease. The recommended interval between screening varies according to specific country guidelines; annual or biennial screening is most commonly recommended. Visualization 14 can be used to assess the accessibility of screening for diabetic retinopathy for people who have been referred, and the capacity of the facility to meet the demand. Facility managers may use this information to improve service planning and discover trends in the referral system, with the aim of improving coverage.

The monthly data collection frequency for the data elements related to this indicator was suggested based on feasibility. However, in settings where this is more appropriate, the analysis of the data can be done in a quarterly or annual basis.

Visualization 14: Timeline of number of people screened for diabetic retinopathy and percentage of diabetic retinopathy screening, for selected facility, April 2022 – March 2023



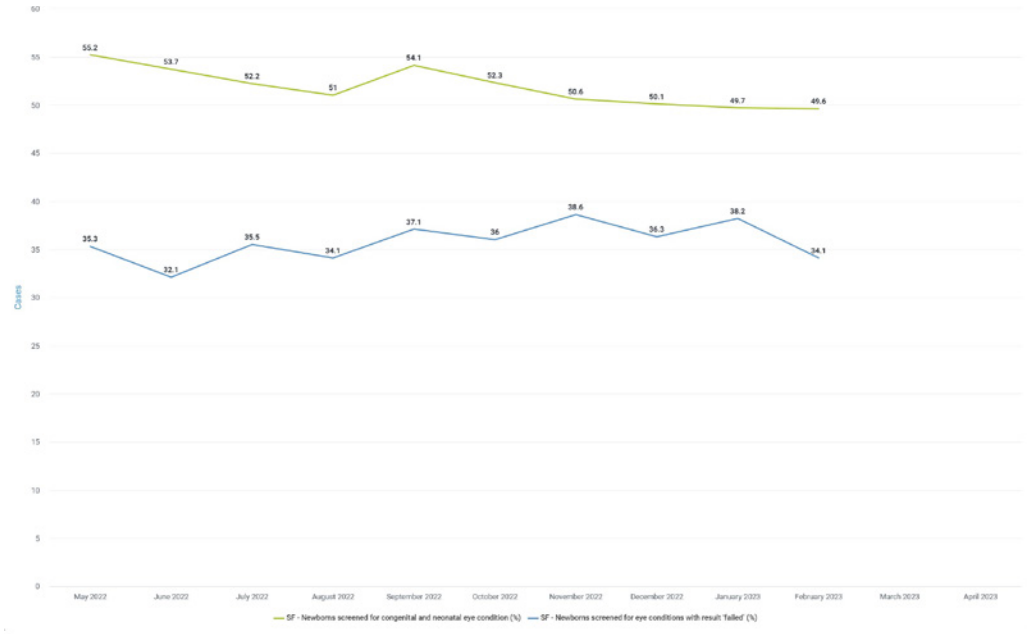
Newborn screening

Indicators: Newborn screening for congenital and neonatal eye conditions and Access to screening for retinopathy of prematurity (ROP).

Purpose: To provide information about the percentage of newborns screened for congenital and neonatal eye conditions from the total of live births; and the percentage of eligible preterm infants receiving ROP screening (eligibility for screening: birthweight and gestational age with or without additional criteria for sickness, as determined by local guidelines).

Visualizations and considerations for interpretation: The screening of newborns for congenital and neonatal eye conditions (visualization 15), preferably within 72 hours of birth, is the first step towards better identification of, and early intervention for, eye conditions, such as congenital cataract, congenital glaucoma or retinoblastoma. Facility managers may use this information to detect any failures in the referral system and for service planning, with the aim of improving coverage. The disaggregation according to the result of the screening, as "passed" (i.e. no eye condition detected or suspected) or "failed" (i.e. eye condition detected or suspected), also provides important information for the planning of services and to detect epidemiological trends.

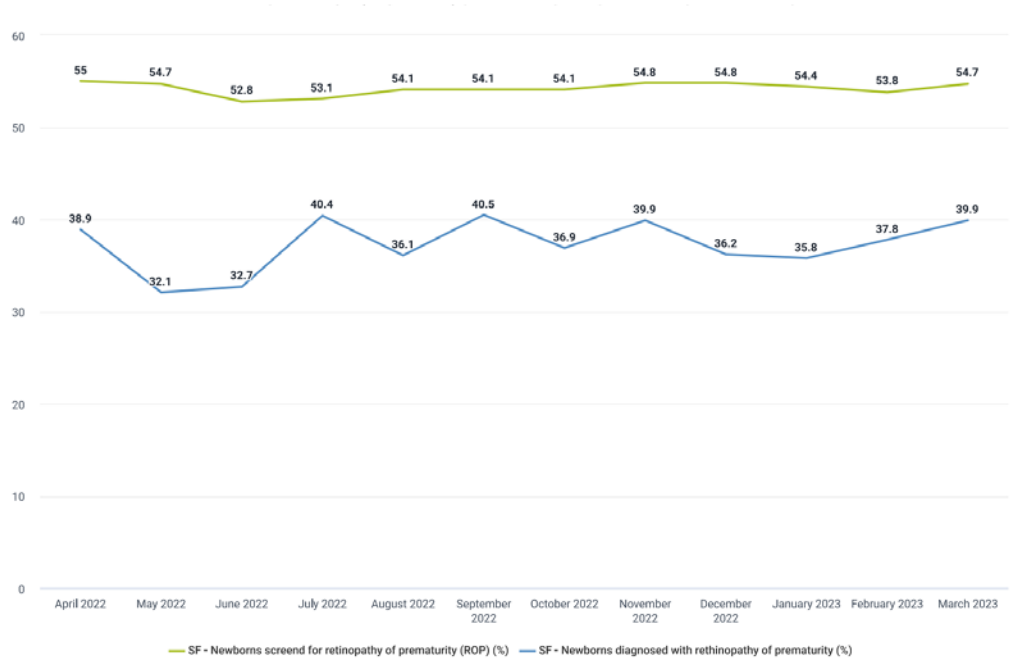
Visualization 15: Timeline of access to newborn screening for congenital and neonatal eye conditions (%) and failed results among newborns screened (%), for selected facility, April 2022 – March 2023



Additionally, due to an increase in the number of preterm births, and survival of premature infants, ROP has become a leading cause of childhood blindness in many middle-income countries. Systematic retinal screening of eligible, preterm, low-birth-weight infants, using local, evidence-based screening criteria followed by urgent treatment for those developing the vision-threatening signs of ROP, reduces the risk of vision impairment or blindness. This dashboard can be used to assess the percentage of eligible newborns screened for ROP; and, from those screened, the percentage diagnosed with ROP (visualization 16).

This information can be used in the short-term by facility managers for service planning; and in the long-term as an assessment of the coverage of specific eye care services.

Visualization 16: Timeline of access to retinopathy of prematurity (ROP) screening among newborns eligible for screening, and percentage of ROP diagnosis, for selected facility, April 2022 – March 2023



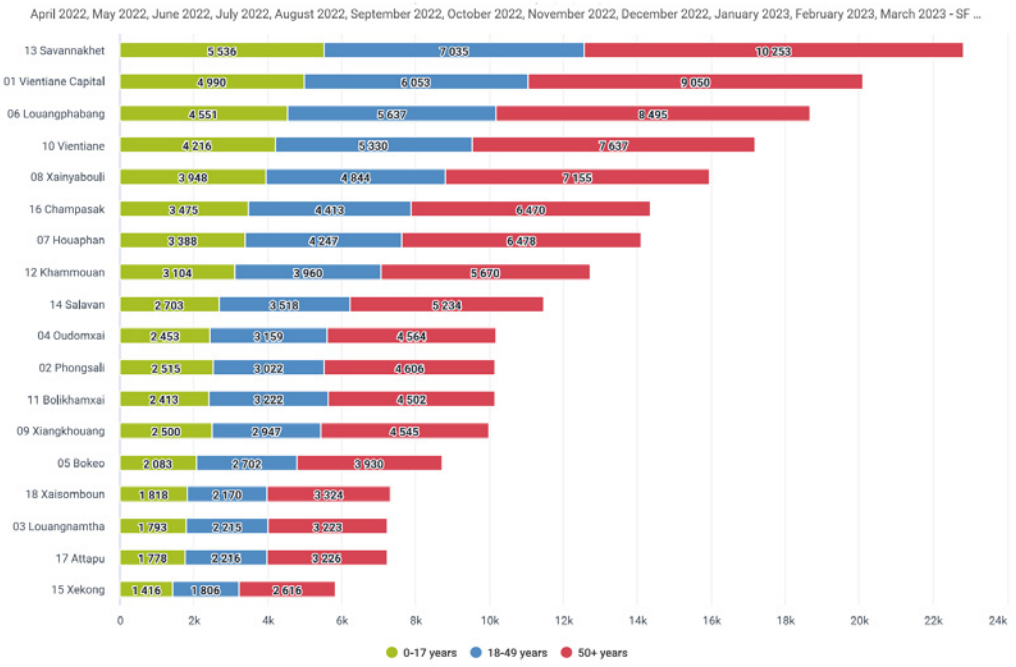
Eye care – subnational and national decision-makers

A (sub)national level dashboard contains four sections: service use distribution; vision status; cataract surgery; and newborn screening. This dashboard aims to display the results of data collected for the same indicators as the previous dashboard but targeting analysis by subnational programme planners and national health authorities.

Service use distribution

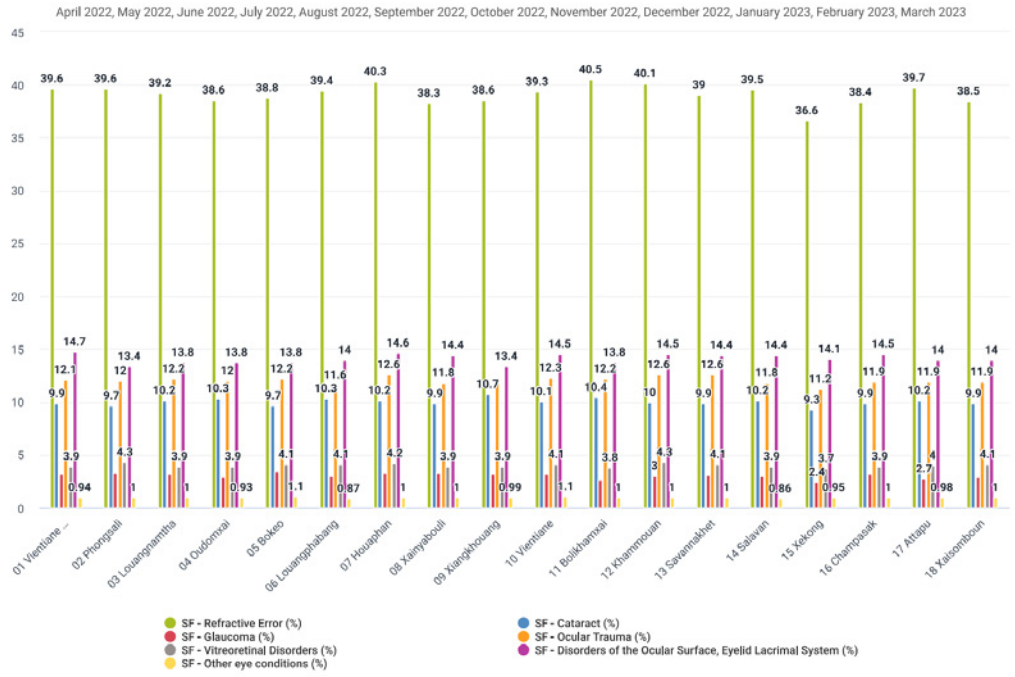
Visualizations and considerations for interpretation: The volume of eye care visits in a district reflects the national/subnational capacity to respond to the population's needs. The disaggregation by selected age groups aims to monitor service use and assess time trends, allowing heath authorities or national programme planners to develop mid- to long-term planning that involves capacity-building measures (visualization 17).

Visualization 17: Number of eye care visits for selected age groups, by district, April 2022 – March 2023



Data on the use of eye care services for specific categories of eye conditions at subnational level (visualization 18), provide information on epidemiological trends, both locally and over time, facilitating long-term planning for service delivery and awareness campaigns targeted at the most frequently occurring eye conditions.

Visualization 18: Percentage of eye care first visits for selected eye conditions categories, by district, April 2022 – March 2023



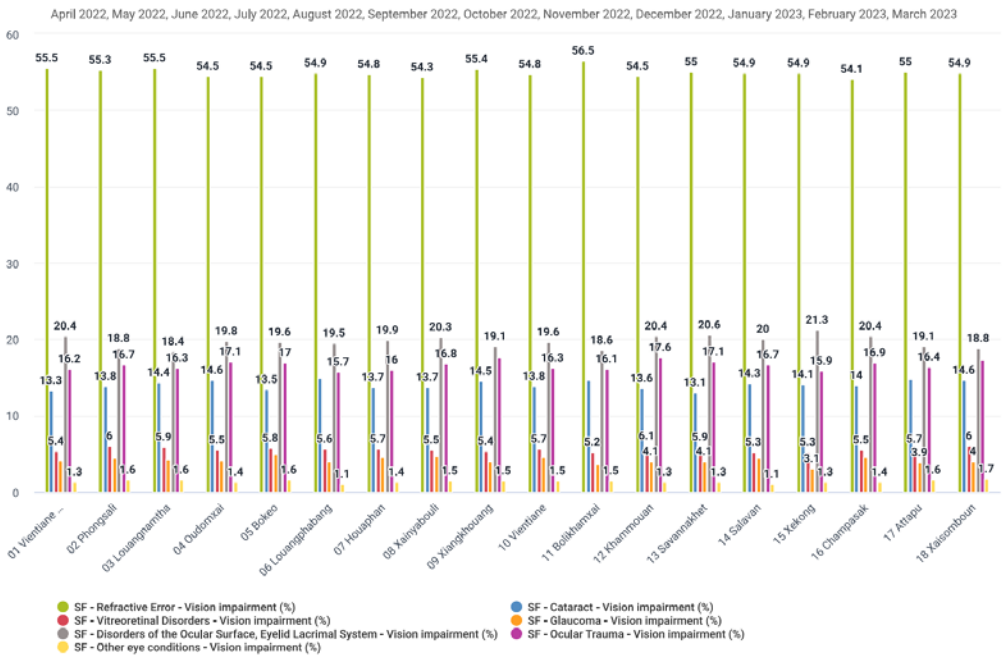
Vision status

Visualizations and considerations for interpretation: This dashboard provides the total number of cases of vision impairment per 10 000 population, diagnosed among first visits to eye care services in the country (visualization 19). It also shows the distribution of cases of vision impairment according to the eye condition and to the selected age groups at a subnational level (visualizations 20 and 21).

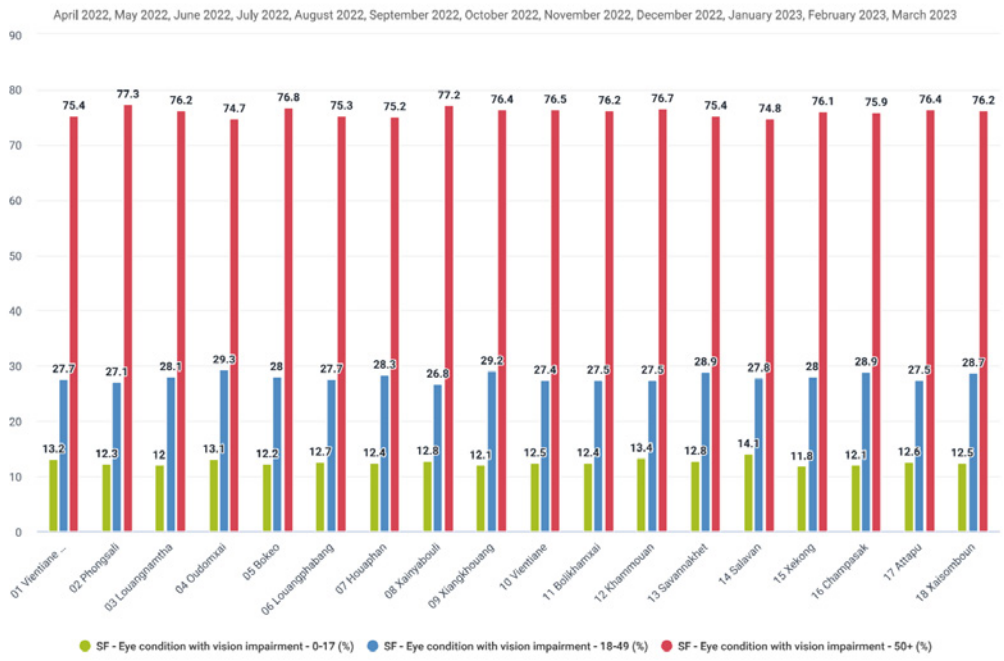
This information allows real-time monitoring of vision-impaired people who access services; it also assists national health authorities to identify epidemiological trends that can affect service utilization and delivery, and to plan accordingly for the prevention of vision impairment and blindness.

Visualization 19: Cases of vision impairment (visual acuity worse than 6/12) per 10 000 population diagnosed among first visits to eye care services in the country, April 2022 – March 2023

Visualization 20: Distribution of use of eye care services by people with selected category of eye condition, with vision impairment, for a selected district, April 2022 – March 2023



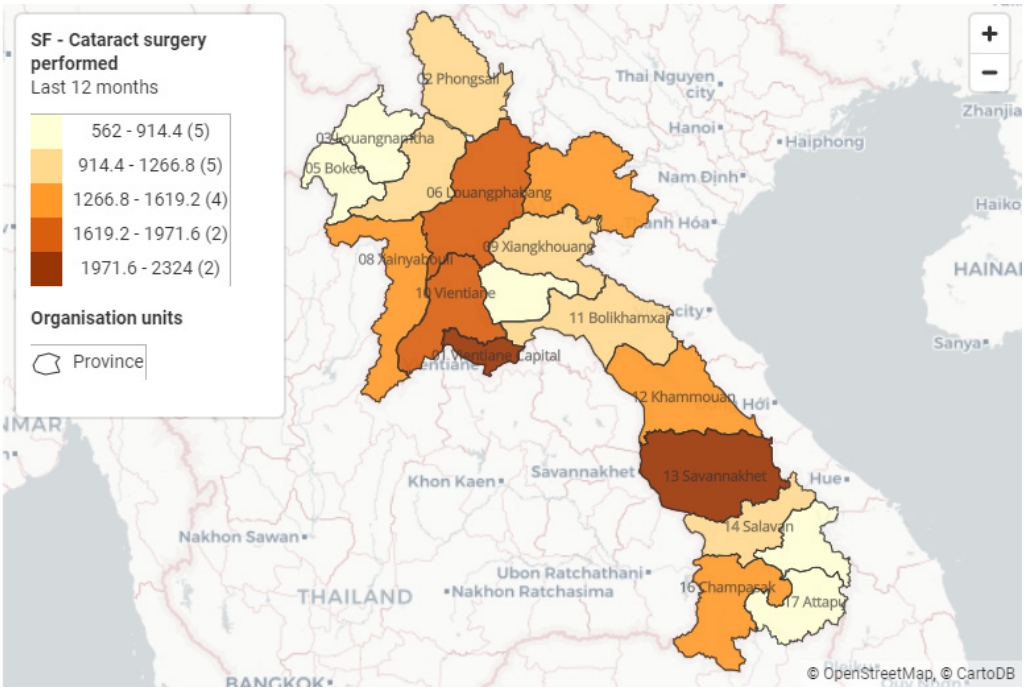
Visualization 21: Timeline of number of eye conditions diagnosed among first visits by age group, for selected district, April 2022 – March 2023



Cataract surgery

Visualizations and considerations for interpretation: In many countries, the availability of specific eye care services, such as cataract surgery, is concentrated mainly in urban areas. Visualizations 22 and 23 present maps of facilities providing cataract surgery (visualization 22), and the number of surgeries performed by district (visualization 23). The visualizations can be used to assess geographical equity and to compare services for cataract surgery that are provided by different facilities and districts within a country.

Visualization 22: Distribution of number of cataract surgeries, by district, national, 2022



Visualization 23: Timeline of number of cataract surgeries, by district, April 2022 – March 2023

Cataract surgeries performed													
	SF - Cataract surgery performed												
	April 2022	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	Total
01 Vientiane Capital	129	167	195	183	199	158	188	195	170	179	147	166	2 076
02 Phongsali	97	97	90	73	93	72	79	74	81	76	96	84	1 012
03 Louangnamtha	48	67	62	61	67	37	71	38	63	51	67	39	671
04 Oudomxai	88	87	70	105	85	79	86	80	83	98	78	95	1 034
05 Bokeo	70	52	75	69	65	73	64	73	66	80	65	81	833
06 Louangphabang	196	135	152	133	144	136	178	166	141	148	156	164	1 849
07 Houaphan	116	111	119	126	120	135	123	120	143	118	137	135	1 503
08 Xainyabouli	126	109	136	136	152	130	118	145	156	130	136	143	1 617
09 Xiangkhouang	73	99	86	83	93	79	90	71	85	92	84	90	1 025
10 Vientiane	147	133	159	143	147	163	130	128	144	134	132	124	1 684
11 Bolikhamxai	83	90	75	84	86	64	88	99	84	66	81	84	984
12 Khammouan	94	121	110	126	100	88	101	117	101	109	110	120	1 297
13 Savannakhet	192	184	177	181	227	196	204	198	171	182	210	202	2 324
14 Salavan	75	86	88	104	106	85	79	105	112	99	105	103	1 147
15 Xekong	53	54	44	55	37	54	42	27	40	62	54	40	562
16 Champasak	131	132	125	110	126	139	121	110	120	125	128	132	1 499
17 Attapu	54	69	62	41	46	57	62	54	39	40	57	60	641
18 Xaisomboun	76	81	57	49	74	43	72	73	52	67	55	63	762
Total	1 848	1 874	1 882	1 862	1 967	1 788	1 896	1 873	1 851	1 856	1 898	1 925	22 520

The information on the average waiting time for people to receive cataract surgery (measured from first registration for surgery to the surgery itself) for different districts (visualization 24) and for different facilities (visualization 25), can

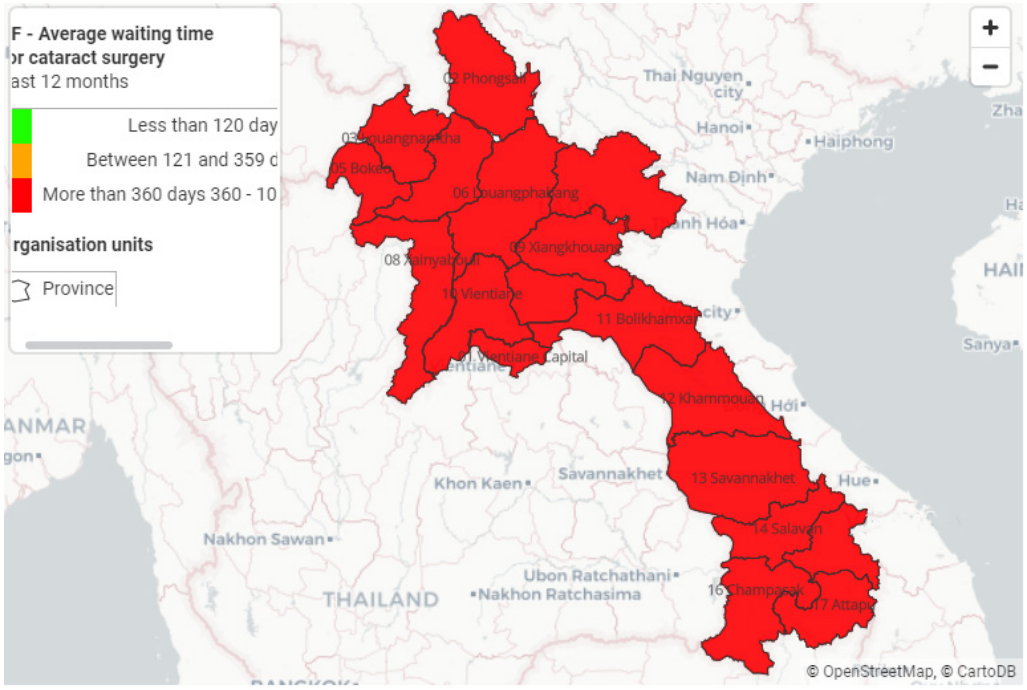
be used to assess equitable and timely access to cataract surgery across regions and facilities, as well as to compare the services provided for surgery for the different facilities and districts within a country.

This information may be used by national health authorities to identify possible existent barriers in accessing cataract surgery, such as insufficient provision of services to meet demand, as well as to assess the performance of referral systems already in place. In addition, time trends can be analysed at national and subnational levels to establish baselines and to monitor efforts towards achieving an equal distribution nationally. Health authorities and national programme managers can identify possible existent barriers and set their own national and subnational standards based on population needs.

Visualization 24: Timeline of waiting time for cataract surgery by district, April 2022 – March 2023

Average waiting time for cataract surgery													
	SF - Average waiting time for cataract surgery												
	April 2022	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	Total
01 Vientiane Capital	814.9	394.6	409.3	473.4	428.5	449.9	406.7	448.4	427.8	439.6	470.3	461.7	460
02 Phongsali	366.4	439.8	337	649	388.1	692.9	509.3	637.5	588	489.5	566.3	431.9	498.8
03 Louangnamtha	401.2	345.1	454.8	511	471.5	713.6	333.3	782.9	411.2	615	521	836.8	503.7
04 Oudomxai	550.2	571.1	606.6	376.3	572.8	505.6	390.8	358.7	326.3	235.7	648.8	433.8	457.4
05 Bokeo	510.7	524.3	373.3	272.3	436.5	417.7	567.6	521.2	430.1	430.3	554.5	490	458.1
06 Louangphabang	408	592.9	428.3	432.9	434.4	522.8	354.9	467.1	364	391.2	456.1	396.6	434
07 Houaphan	438.2	576.1	387.3	412.6	476.7	326.2	468.2	443.1	293.7	409.5	317.1	412	408.7
08 Xainyabouli	346.5	554.7	492.2	541.7	444.2	515	512.2	478	321.1	486.3	449	479	464.9
09 Xiangkhouang	389.8	499.4	584	604.6	392.3	363.7	479.8	685.2	433.4	359.6	358.6	467.5	465.8
10 Vientiane	525.5	504.1	414.4	495.4	429.6	336.7	554.7	414.4	399.3	480.2	512	535.2	463.2
11 Bolikhamxai	482.7	392.5	490	406.5	480	521.3	336.4	272.4	646.8	485	435.1	459.6	444.8
12 Khammouan	522.1	316.2	426.1	365	476.8	458	502.4	327.7	393	383.3	351.6	428.2	407.7
13 Savannakhet	363.3	428.7	477.9	369.2	464	483	493.2	491.5	543.5	451.5	465.9	491.2	460.5
14 Salavan	454.9	539.1	614.8	407.1	288	599.6	596.4	488.1	393.3	475.3	422.7	499.7	474
15 Xekong	543.3	531.9	571.8	496.6	504.5	329	489.4	598.4	572.7	363.5	499	566.7	495
16 Champasak	338.5	435.5	457.9	508.2	452.3	493.6	328.1	384.3	406	453	513.2	431.1	434
17 Attapu	657.3	513.9	489.4	638.7	431.2	457.7	479	465.5	713.1	568	545.3	549.1	534.8
18 Xaisomboun	370.3	387.9	488.4	617.1	507.8	465.3	403.2	396.8	550.9	441.2	614.7	417.1	461.3
Total	462.2	470.4	460.1	460.1	444.7	467.2	450.3	458.7	431.4	434.3	470	469.4	456.6

Visualization 25: Waiting time for cataract surgery by district, 2022



Newborn screening

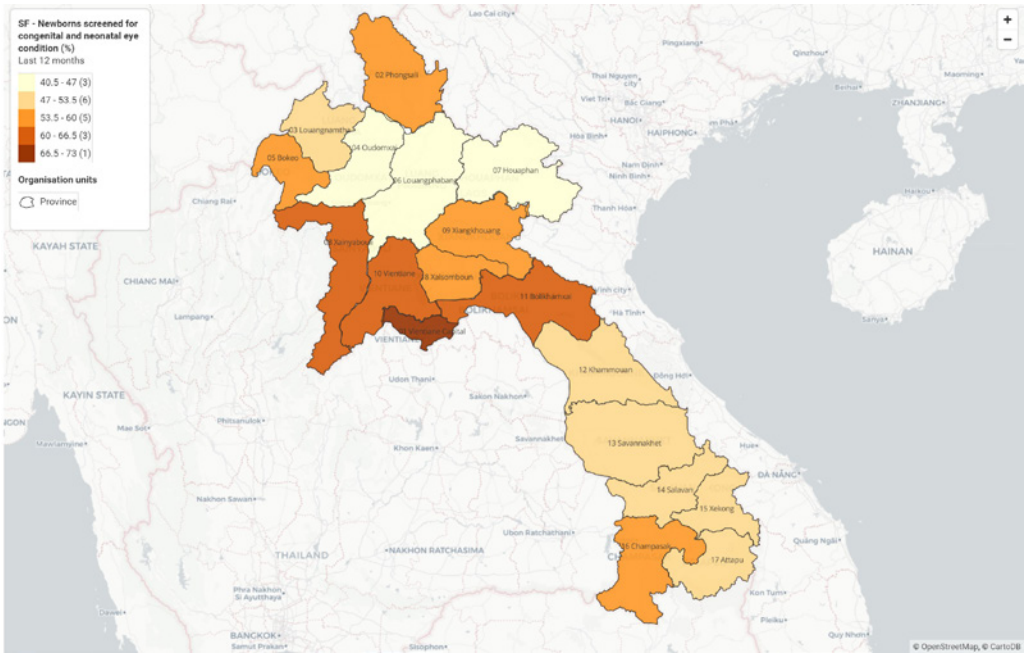
Visualizations and considerations for interpretation: In most countries, the availability of specific services, such as the screening of newborns for congenital and neonatal eye conditions, is concentrated mainly in urban areas. The dashboard should therefore be used to assess accessibility across geographical regions. The visualizations of the percentage of newborns screened for congenital and neonatal eye conditions by district and by facility on a map (visualizations 26 and 27) enable assessment of equitable access to screening across regions, and comparisons of availability and accessibility across facilities that provide this service and reporting in HMIS.

National health authorities and programme planners may use this information to detect any issues relating to geographical coverage and, over time, to monitor measures for improving accessibility to this specific eye care service.

Visualization 26: Timeline of newborns screened for congenital and neonatal eye conditions (%) by district, April 2022 – March 2023

	Newborns screened for eye condition											
	SF - Newborns screened for congenital and neonatal eye condition (%)											
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	April 2023
01 Vientiane Capital	10.1%	11.4%	10%	9%	10.4%	11%	8.3%	9.6%	9.8%	10.4%		
02 Phongsali	10.4%	9.5%	11%	8.4%	11.1%	10.2%	10.4%	9.9%	10%	9.1%		
03 Louangnamtha	11.5%	10%	10.4%	9.9%	11%	8.1%	8.8%	9.7%	10.9%	9.7%		
04 Oudomxai	10.2%	10%	9.3%	9.4%	11.4%	9.8%	9.3%	11.6%	10.5%	8.5%		
05 Bokeo	10.8%	12.2%	9.4%	11.1%	10%	9.9%	10.3%	9.8%	8.8%	7.7%		
06 Louangphabang	10.2%	11%	9.6%	9.4%	10.6%	9.2%	10.2%	10.1%	9.2%	10.5%		
07 Houaphan	11.2%	10.5%	10.2%	10.2%	10.3%	9.1%	9.9%	9.5%	9.4%	9.6%		
08 Xainyabouli	10.4%	10.1%	10.5%	9.4%	10.2%	9.9%	9%	10%	10.2%	10.4%		
09 Xiangkhouang	11.1%	10.4%	9.8%	10.6%	11.3%	9.8%	9.5%	9.1%	9.8%	8.6%		
10 Vientiane	10.1%	10.1%	11%	10%	10.1%	10.3%	9.6%	9.2%	9.7%	10.1%		
11 Bolikhamxai	12%	9.5%	9.4%	9.8%	11%	10.2%	9%	9.5%	9.7%	9.9%		
12 Khammouan	10.7%	10.7%	9.3%	10.8%	11.2%	9.4%	9.9%	9.9%	8.9%	9.1%		
13 Savannakhet	11%	9.9%	10.2%	9.4%	10.2%	11%	9.9%	9.1%	9.7%	9.7%		
14 Salavan	10.9%	11%	10.5%	10%	9.7%	10.6%	10.4%	9.5%	8.4%	8.9%		
15 Xekong	11.7%	11.6%	10.4%	8.3%	8.2%	9.5%	10.5%	7.5%	11.5%	10.7%		
16 Champasak	9.6%	10.2%	9.7%	11.1%	10.9%	9.8%	10.1%	9.4%	9.3%	9.9%		
17 Attapu	7.5%	10%	10.8%	9.7%	8.2%	11%	10.3%	12.4%	10.6%	9.4%		
18 Xaisomboun	9.5%	11.6%	10.7%	10%	8.6%	11.4%	10.2%	8.3%	9.3%	10.4%		
Total	10.5%	10.5%	10.1%	9.8%	10.2%	10.1%	9.7%	9.6%	9.7%	9.6%		

Visualization 27: Newborns screened for congenital and neonatal eye conditions (%), by district, 2022



Ear and hearing care

For the purpose of data analysis, guidance has been organized for: the interpretation of workforce data; the interpretation of ear and hearing care data by facility managers; and the interpretation of ear and hearing care data by (sub)national decision-makers.

Ear and hearing care workforce

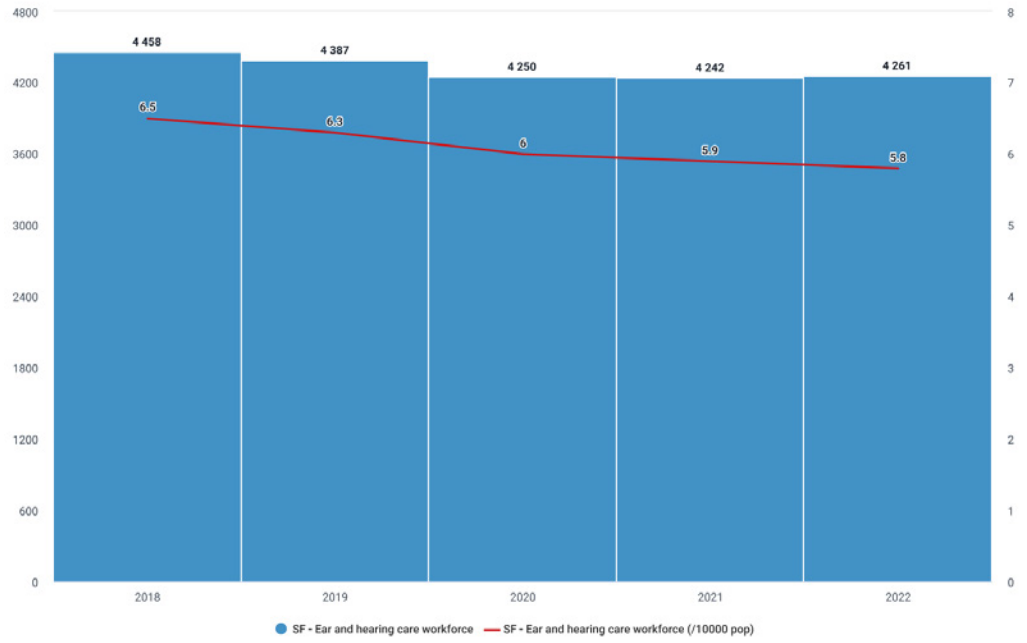
Indicator: Ear and hearing care workforce density and distribution.

Purpose: To provide basic information about the availability, composition and distribution of the human resources needed for the provision of essential ear and hearing care services. An indirect assessment of the quality of services can also be made. To allow comparability, the ear and hearing care professions selected correspond to those in the *WHO Ear and hearing care: situation analysis tool (7)*.

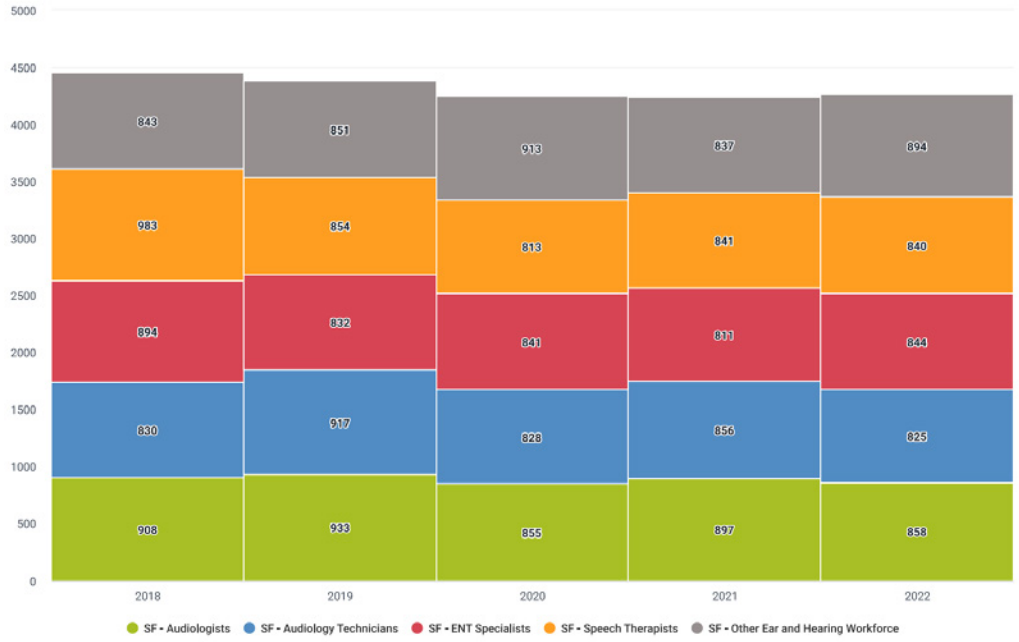
Visualizations and considerations for interpretation: In the field of the ear and hearing care, there is no global recommended standard regarding the workforce density in relation to the total population. However, the global shortage in the ear and hearing care workforce, especially in low-resource settings, is widely recognized *(2)*. Adequate levels of workforce density depend on the context of each country, and recommendations should be made based on population needs at country level. This dashboard can be used to assess the total number of ear and hearing care workers and overall density (visualization 28); the number of different ear and hearing care professionals (visualization 29); and the respective densities of different ear and hearing care professionals (visualization 30), over time.

Given the lack of global recommendations, health authorities and national programme managers should compare their data periodically with countries with similar socioeconomic backgrounds. Assessment of the availability of different professions indirectly informs the quality of the ear and hearing care service delivery system. This information can be used at facility level for service planning; and at subnational and national levels to identify shortages, allocate resources effectively, and to better distribute the workforce across health facilities or programmes to meet population needs.

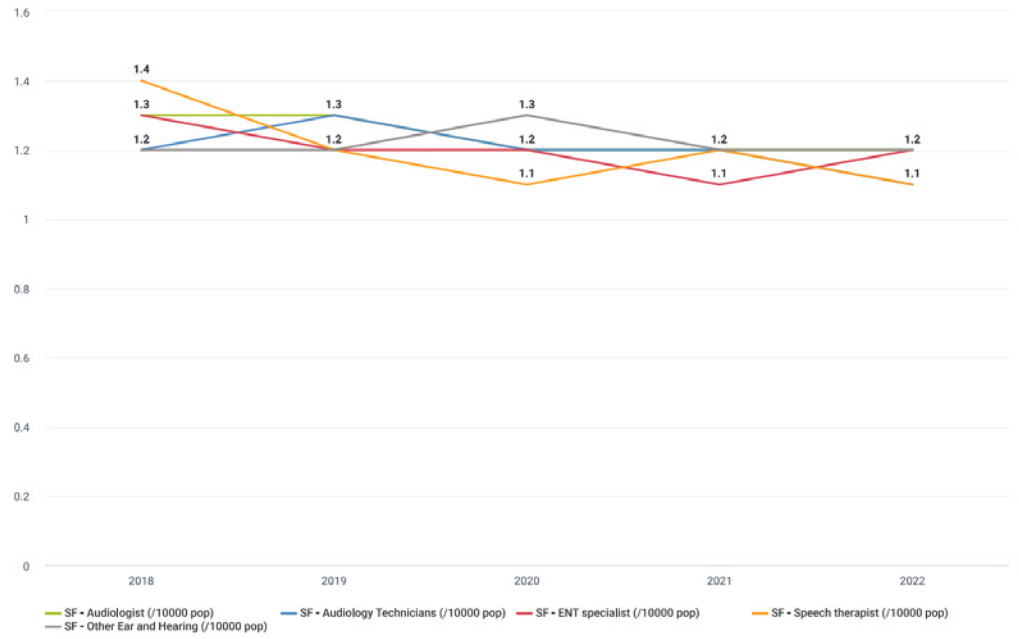
Visualization 28: Timeline of number of ear and hearing care workers and overall density, national, 2018 – 2022



Visualization 29: Timeline of number of ear and hearing care workers by profession, national, 2018 – 2022

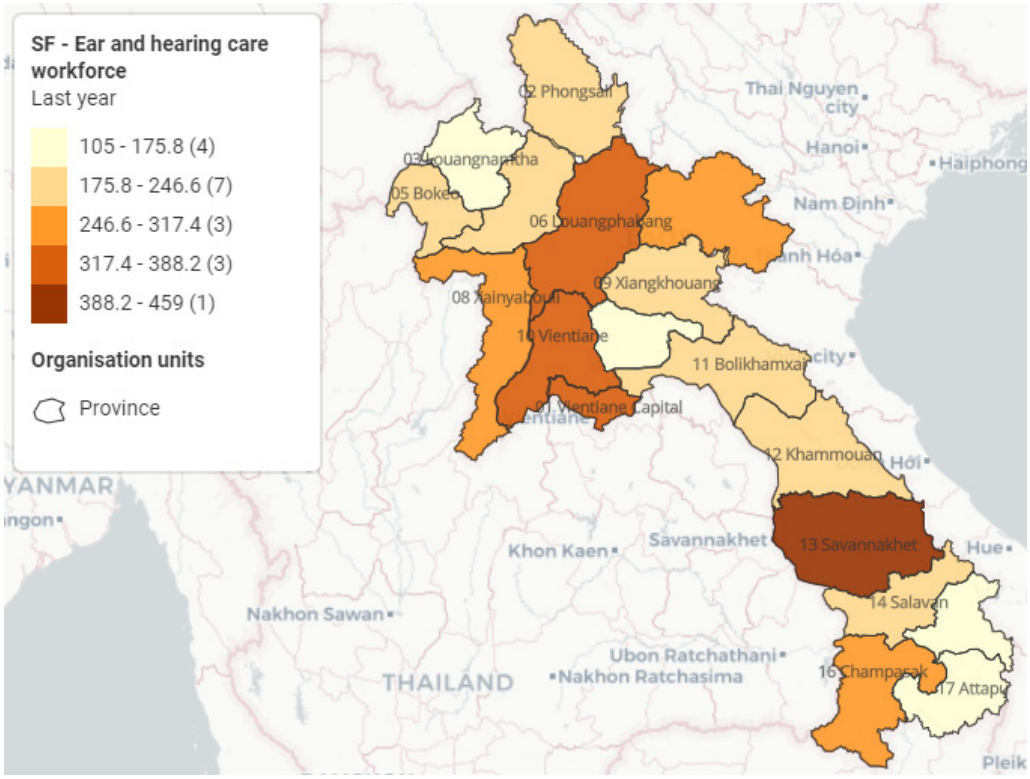


Visualization 30: Timeline of the density of ear and hearing care workers by profession, national, 2018 – 2022

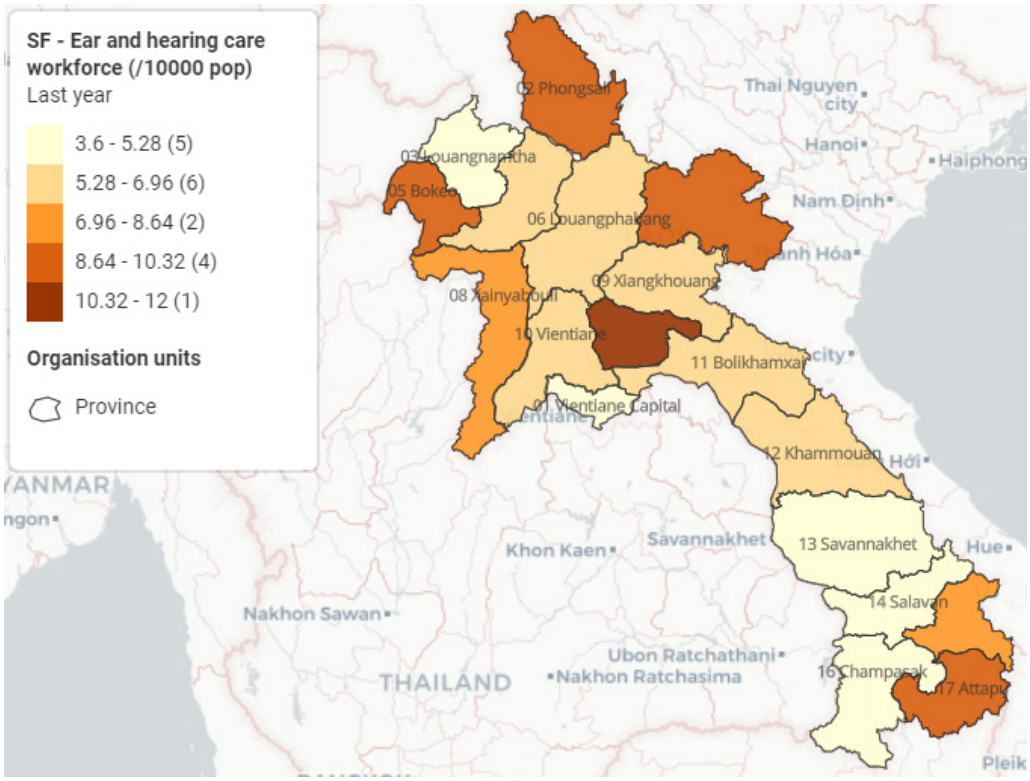


The dashboard can also be used to assess the distribution of the ear and hearing care workforce within the country in terms of absolute numbers, or workforce densities for given geographical regions. Visualizations 31 and 32 display a country map which uses colour coding to show the location of facilities, the number of ear and hearing care workers, and workforce density for the district. In many countries, availability of ear and hearing care workforce is concentrated mainly in urban areas. The visualizations can be used to assess equal geographical distribution and comparison of ear and hearing care workforce densities for given geographical regions.

Visualization 31: Number of ear and hearing care workers (total), by district, 2022



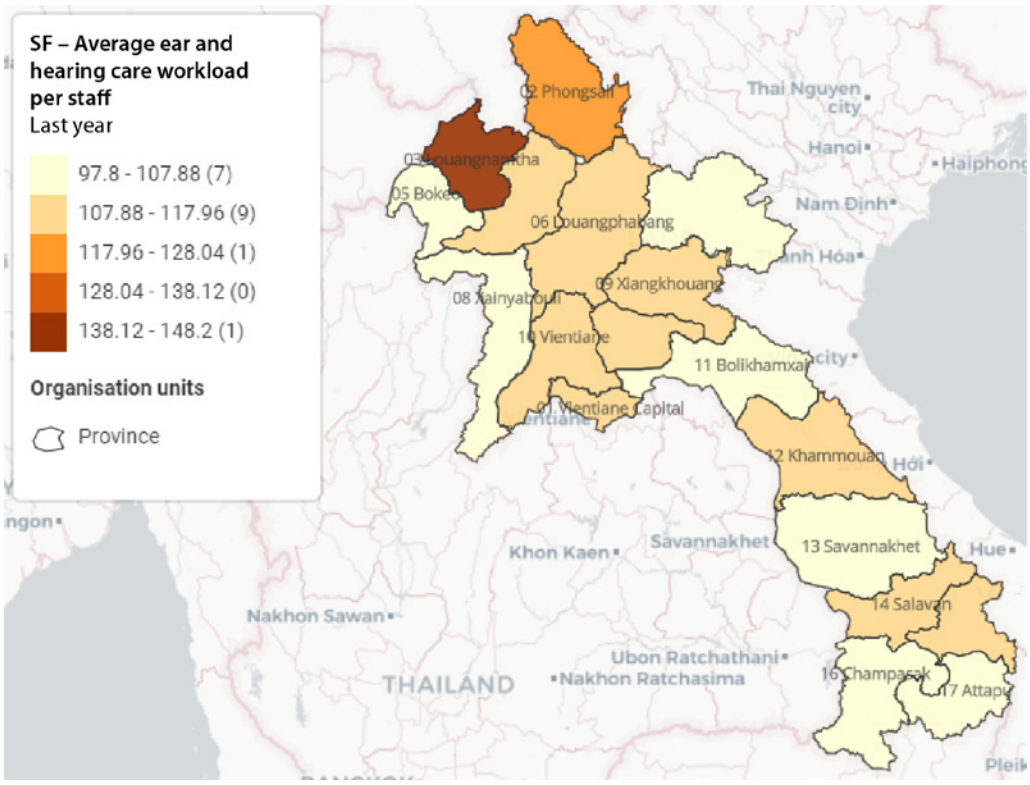
Visualization 32: Density of ear and hearing care workers (total), by district, 2022



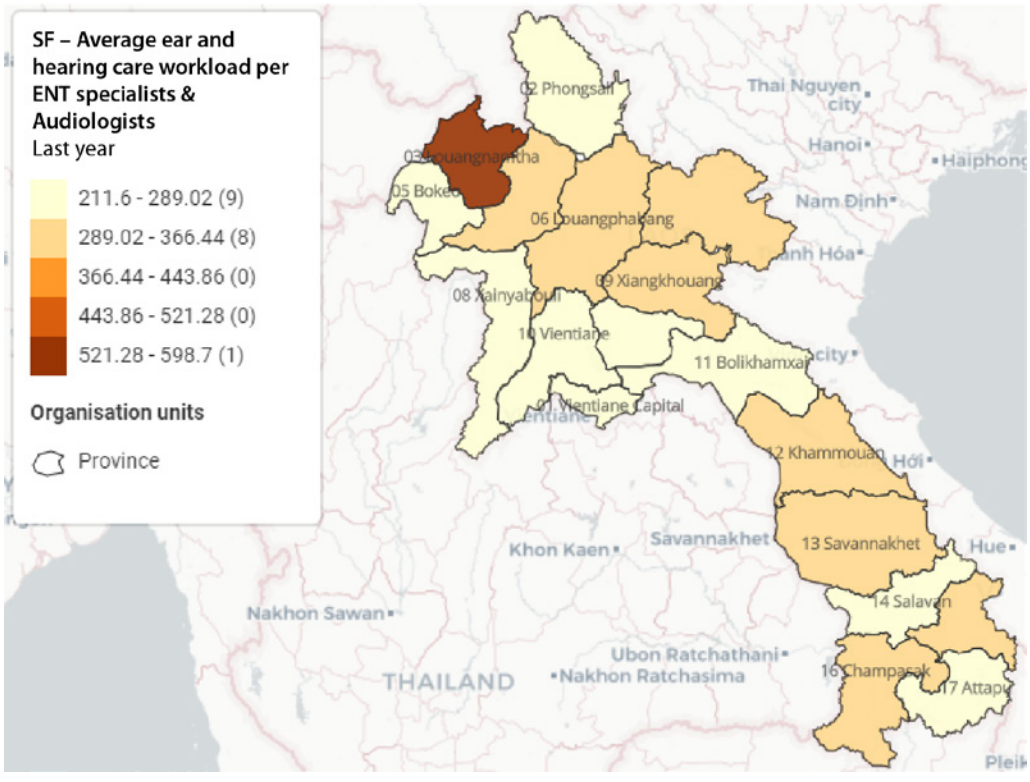
It is also possible to assess the average workload per ear and hearing care worker (visualization 33), and the average workload per autonomous ear and hearing care worker (visualization 34). Ear and hearing care interventions often require a multidisciplinary workforce with a wide range of competencies; these are typically represented in the professions described. With full consideration for the variability of scopes of practice between countries, health authorities and

national programme managers may adapt the profiles to those that best respond to the country's reality.

Visualization 33: Average workload per ear and hearing care worker, by district, 2022



Visualization 34: Average workload per autonomous ear and hearing care worker (ear nose and throat (ENT) specialists and audiologists), by district, 2022



The dashboard can be used to analyse the time trends of workforce density at national and subnational levels to establish baselines and to monitor efforts towards achieving an equal distribution across regions. Health authorities and national programme managers can identify shortages or inconsistencies in the number of eye care workers and set their own national and subnational standards based on population needs.

Ear and hearing care – facility managers

A health facility level dashboard contains four sections: service use distribution; service availability for hearing technology; service accessibility for surgery for middle ear cholesteatoma; and newborn screening.

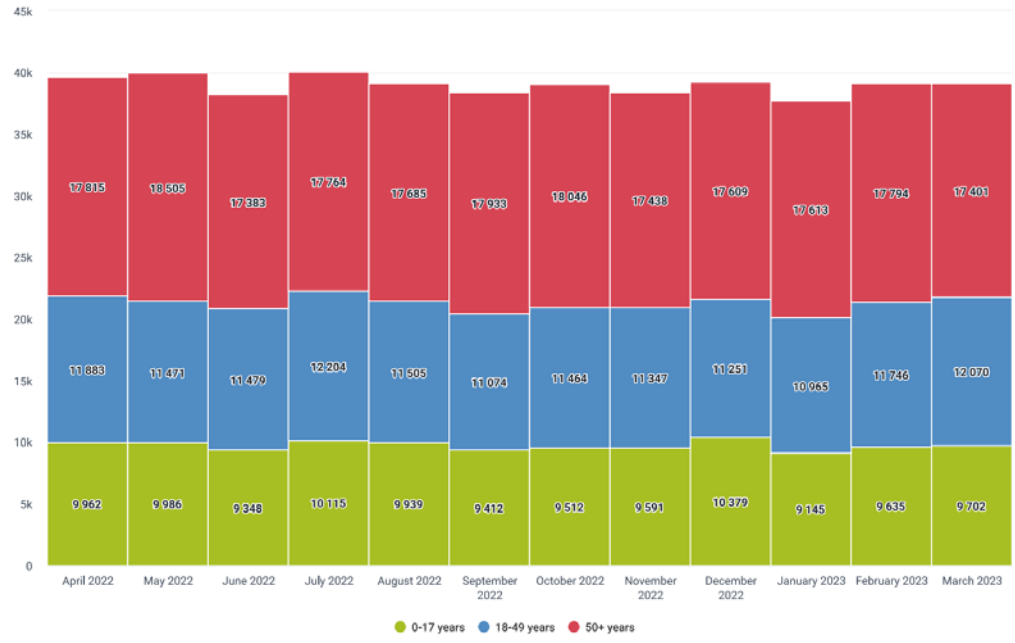
Service use distribution

Indicators: Ear and hearing care service use distribution and Hearing loss diagnosis.

Purpose: To provide information about the use of ear and hearing care services, expressed as the percentage of first visits for selected ear and hearing conditions (categories) disaggregated for age groups and as the percentage of new cases diagnosed with hearing loss for the total number of visits.

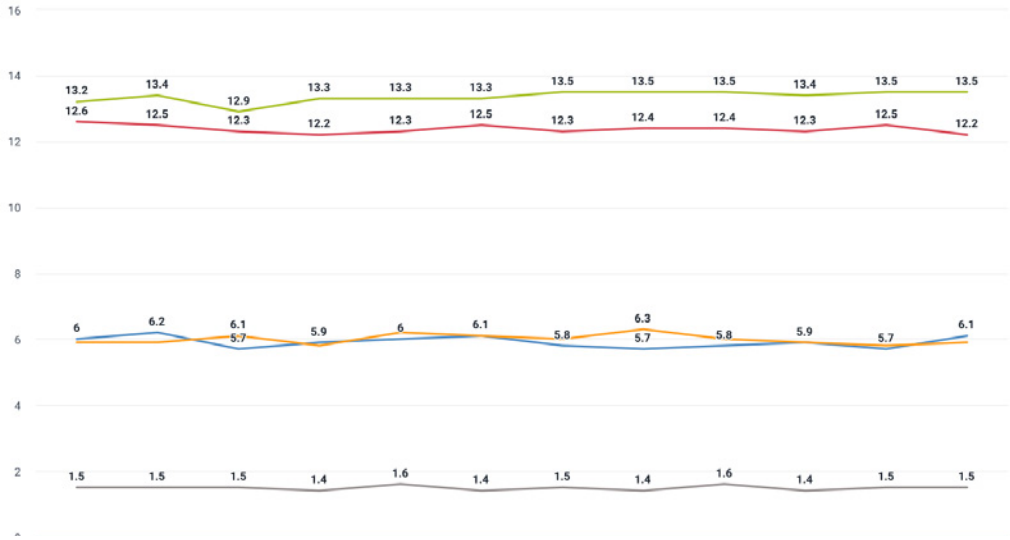
Visualizations and considerations for interpretation: The number of ear and hearing care visits at a facility reflects the capacity of the facility to respond to the population's needs. A visit is defined as an encounter, planned or not, with an ear and hearing care worker by a person who presents in the facility with an ear or hearing care need. This can include both "follow-up" visits (i.e. visits by clients who have been receiving ear and hearing care in previous reporting periods) and "first" visits (visits by clients who commence receiving ear and hearing care in the reporting period). The dataset distinguishes both "first" and "follow-up" visits. A disaggregation by defined age groups aims to monitor service use across these subpopulations (visualization 35). This allows mid- to long-term service planning that involves capacity-building measures.

Visualization 35: Number of ear and hearing care visits for defined age groups, for selected facility, April 2022 – March 2023

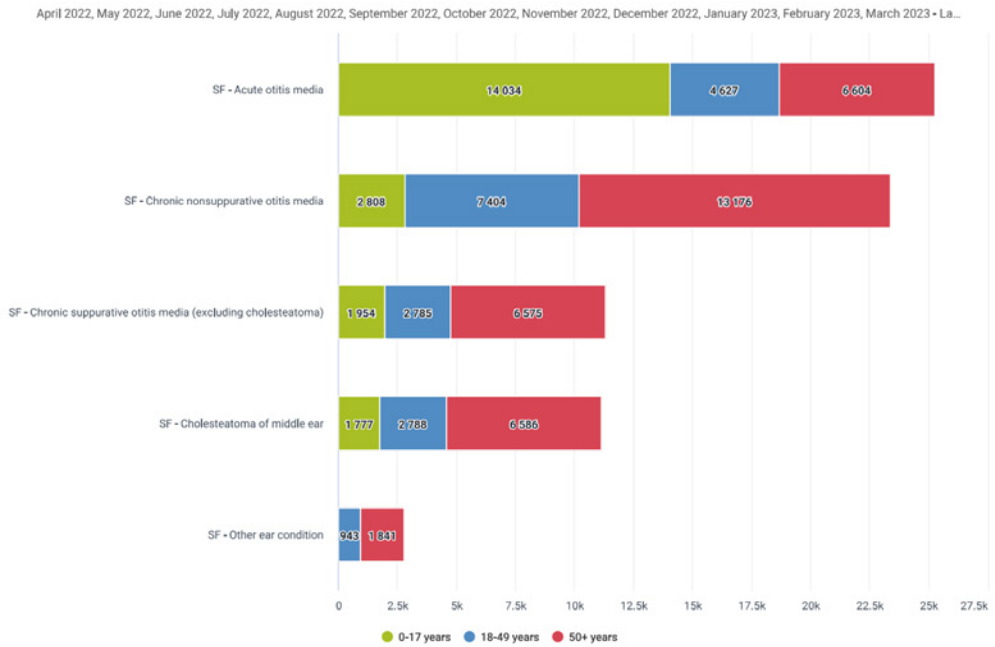


Data on the use of ear and hearing care services for specific categories of ear conditions (visualization 36), provide information on the availability of services for people with such conditions. The extent to which people can access and use ear and hearing care services affects the coverage of interventions. The distribution of first visit for specific ear conditions and the disaggregation by age (visualizations 36 and 37) allow facility managers to plan according to service use trends and to develop capacity-building measures such as workforce requirements. In the short- and medium-term, this information can be used for service planning (for example to allocate resources effectively, or to identify problems and needs); in the long-term, trends that affect service utilization and service delivery can be identified, and ear and hearing care planned accordingly.

Visualization 36: Distribution of ear and hearing care first visits by ear conditions category, for selected facility, April 2022 – March 2023



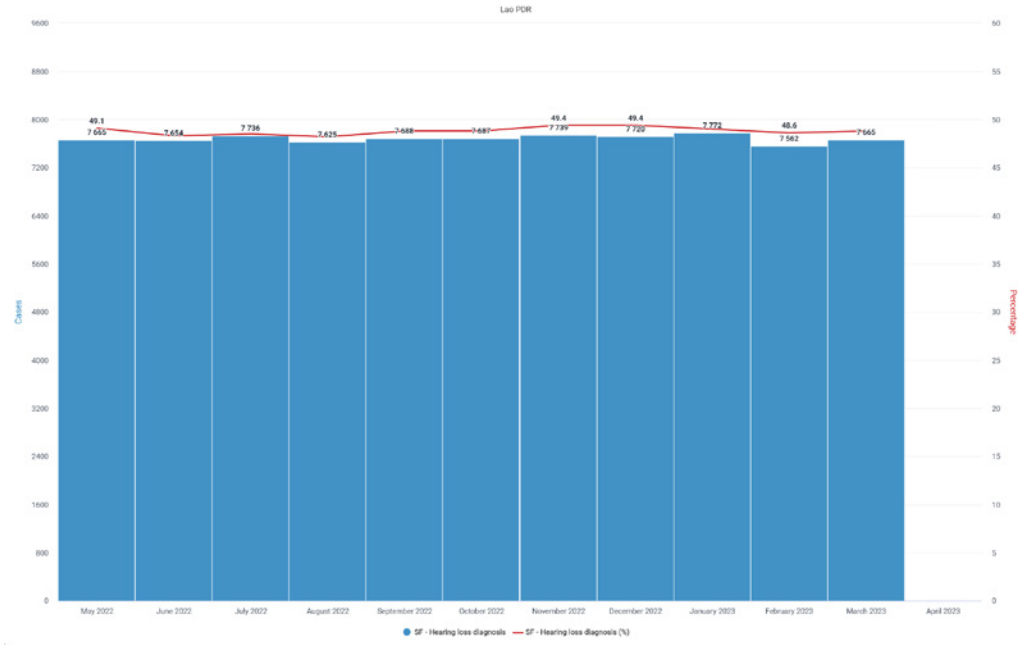
Visualization 37: Number of first visits for defined ear conditions category, by age group, for selected facility, 2022



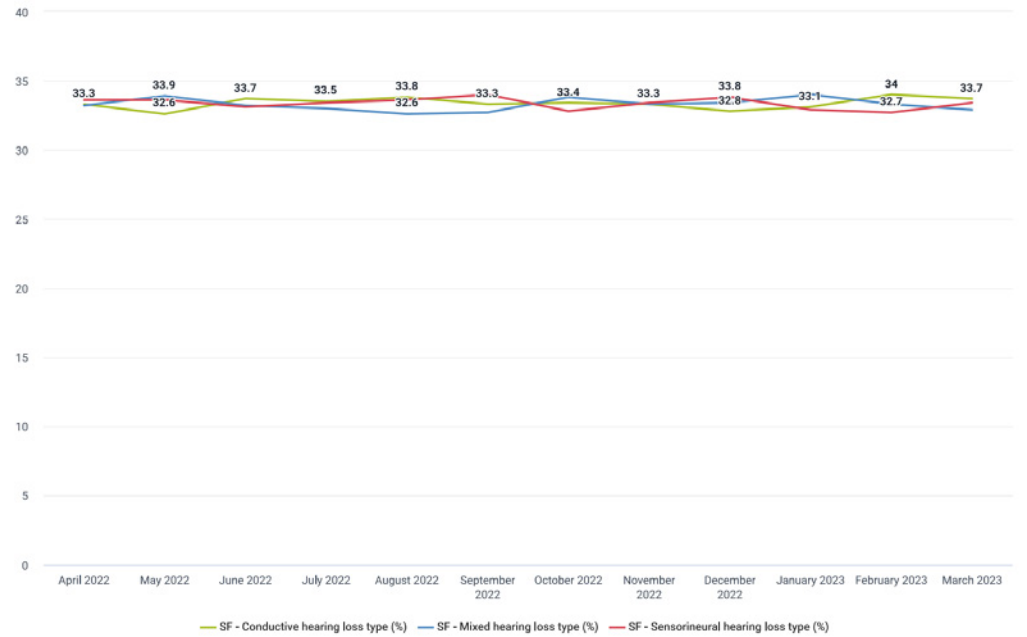
The number of hearing loss diagnosis in the facility by month and their proportion among the absolute number of first visits (visualization 38) and, from those, the proportions of the type and degree of hearing loss (visualizations 39 and 40), allow facility managers to plan according to the epidemiological trends and develop the needed capacity-building measures.

In the short- and medium-term, this information can be used for service planning (for example to allocate resources effectively, or identify problems and needs); in the long-term trends that affect service use and service delivery can be identified, and hearing loss prevention planned accordingly.

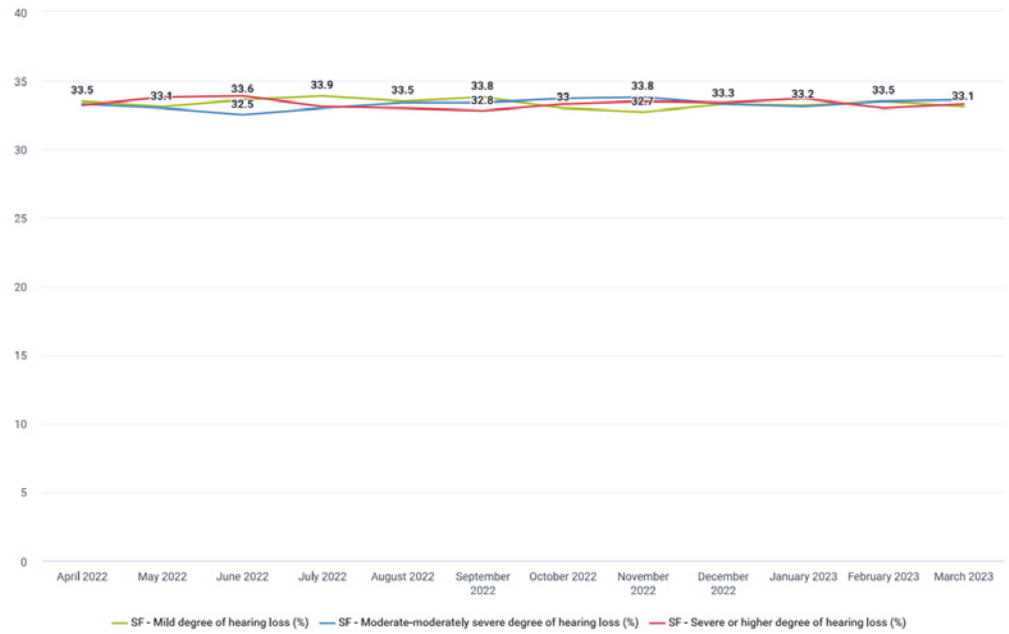
Visualization 38: New hearing loss diagnosis (total) and their proportion among first visits, for selected facility, April 2022 – March 2023



Visualization 39: New hearing loss diagnosed cases per hearing loss type (%), for selected facility, April 2022 – March 2023



Visualization 40: New hearing loss diagnosed cases per hearing loss degree (%), for selected facility, April 2022 – March 2023



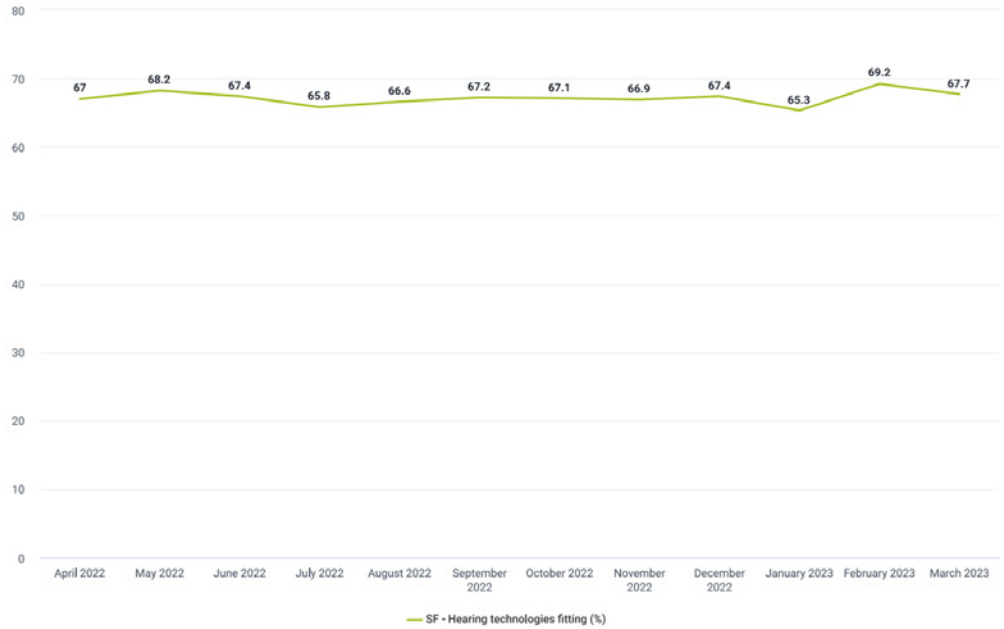
Service availability for hearing technology

Indicators: Access to hearing technologies and Follow-up after hearing technology fitting.

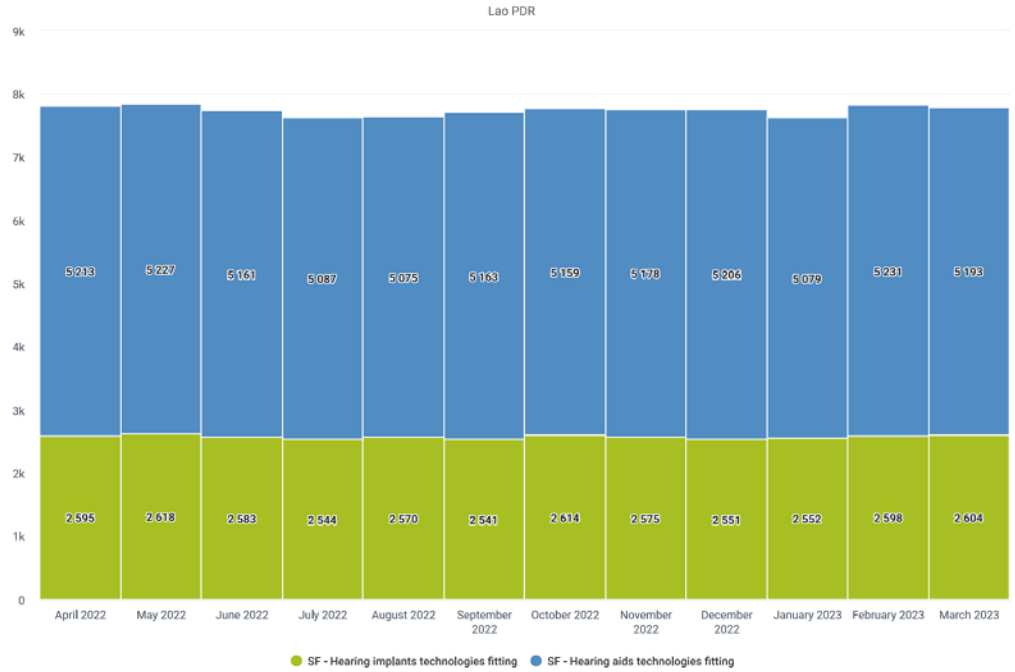
Purpose: To provide information about the availability, accessibility, follow-up evaluations and delivery of hearing technologies to people with hearing loss.

Visualizations and considerations for interpretation: Poor communication among individuals with hearing loss may undermine many health outcomes, including the processes of learning and language, patient satisfaction, adherence to treatment, utilization of health services, education on healthy behaviour and medical costs. Hearing aids have been shown to decrease communication barriers and the consequences of hearing loss for people with disabilities. It is therefore crucial to provide hearing technologies for people with hearing loss. Information on the percentage of those fitted with (or receiving) hearing technologies among the total number of hearing loss diagnosis (visualization 41); and the number of people fitted with (or receiving) hearing technologies disaggregated by the type of hearing technology fitted (hearing implants *vs* hearing aids) in the facility (visualization 42), can be used by facility managers for service planning, better allocation of resources, and for assessing the performance of referral systems. In the long-term, this information can be used as an assessment of the coverage of specific ear and hearing care services.

Visualization 41: Timeline of cases with hearing loss fitted with hearing technologies (%), for selected facility, April 2022 – March 2023



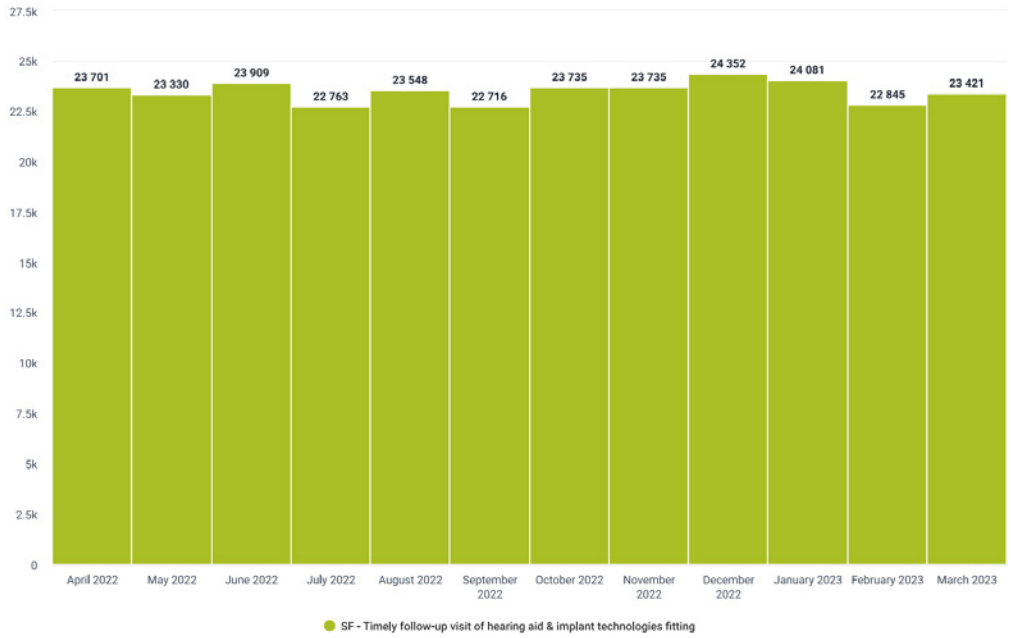
Visualization 42: Timeline of number of hearing loss cases fitted with hearing technology, by type of hearing technology, for selected facility, April 2022 – March 2023



Timely follow-up is an important step in treatment and in improving the quality of services provided to individuals. An assessment of the number of people receiving a follow-up session within six months after being fitted with hearing technology (visualization 43) allows facility mangers to identify problems and needs, and improve referral systems, among other issues.

This information can be used at service level as well as at subnational/national levels for planning services for ear and hearing care.

Visualization 43: Number of cases receiving a follow-up session within six months after being fitted with hearing technology, for selected facility, April 2022 – March 2023



The monthly data collection frequency for the data elements related to this indicator was suggested based on feasibility. However, in settings where this is more appropriate, the analysis of the data can be done in a quarterly or annual basis.

Service accessibility for surgery for middle ear cholesteatoma

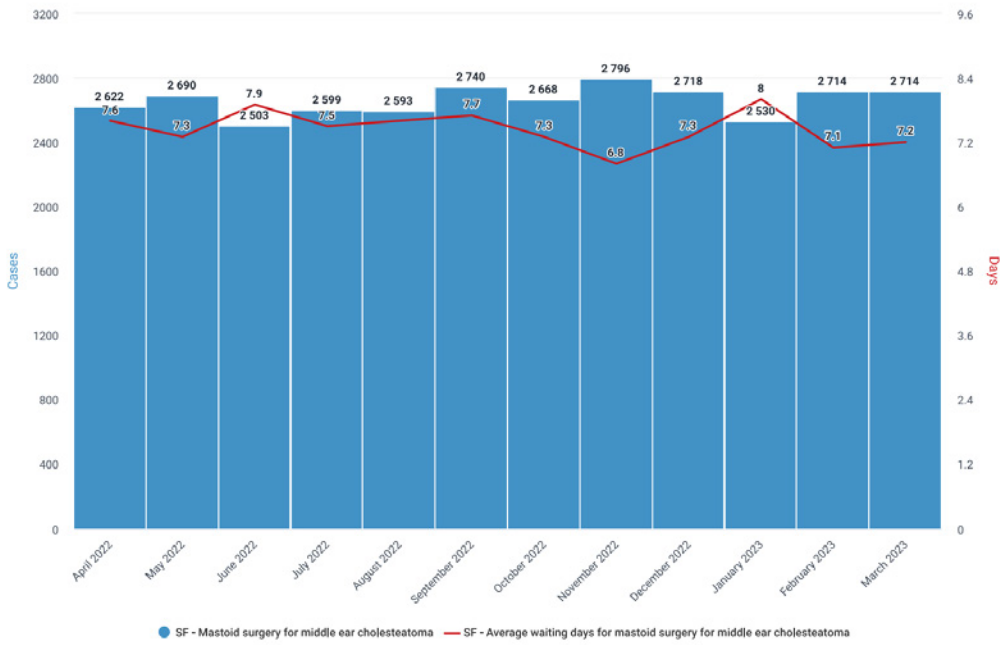
Indicator: Waiting time for surgery for middle ear cholesteatoma.

Purpose: To provide information on the timely access of people in need of mastoid surgery for middle ear cholesteatoma.

Visualizations and considerations for interpretation: The waiting time for mastoid surgery for middle ear cholesteatoma is commonly used as an indicator for the timely provision of services to meet demand. Timely delivery of this surgery is critical to maintain hearing and balance functions, and for preventing and controlling further threatening health conditions. Long waiting times (visualization 44) can demonstrate potential barriers in accessing the surgery, such as insufficient availability of services to meet demand. The analyst should verify whether waiting times are not increasing with increasing numbers of surgeries performed. Excessive waiting times (from referral for surgery to the surgery itself) may be a symptom of inefficiencies in the health-care system and should be reduced in order to avoid deterioration of the health condition.

This information can be used by facility managers in planning services for mastoid surgery for middle ear cholesteatoma, identifying problems and needs, and improving referral systems, among other issues.

Visualization 44: Timeline of number of mastoid surgeries for middle ear cholesteatoma and waiting time for the surgery, for selected facility, April 2022 – March 2023



Newborn screening coverage

Indicator: Newborn screening for hearing loss.

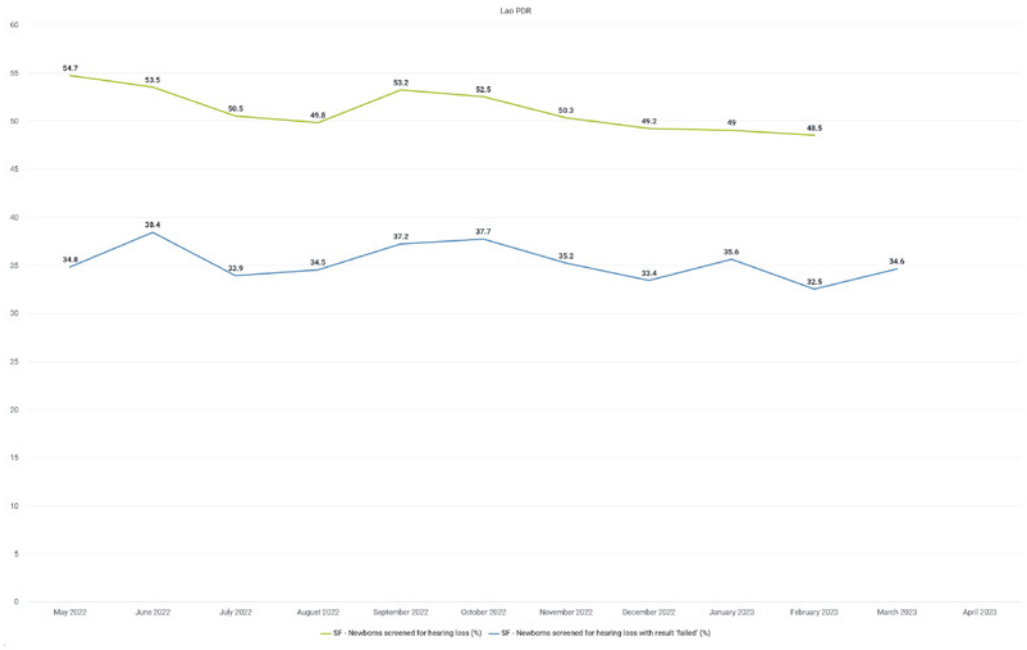
Purpose: To provide information about the percentage of newborns screened for hearing loss prior to discharge from the facility.

Visualizations and considerations for interpretation: Screening newborns for hearing loss prior to discharge is the first step towards better identification of, and early intervention for, hearing loss or other ear related issues. Without hearing screening, newborns/infants with hearing loss are typically identified with an established language delay. With early detection of hearing loss, a child can receive timely and necessary rehabilitation for their speech, language, learning, social and emotional development.

Facility managers may use this information to detect any failures in the referral system and for service planning, with the aim of improving coverage. The disaggregation according to the result of the screening, as "passed" (i.e. no hearing loss detected or suspected) or "failed" (i.e. hearing loss detected or suspected on initial testing), also provides important information for the planning of services and to detect epidemiological trends (visualization 45).

This information can be used by facility managers in the short-term for service planning, and in the long-term as an assessment of coverage of universal newborn hearing screening.

Visualization 45: Timeline of access to newborn screening for hearing loss (%) and failed results among newborns screened (%), for selected facility, April 2022 – March 2023



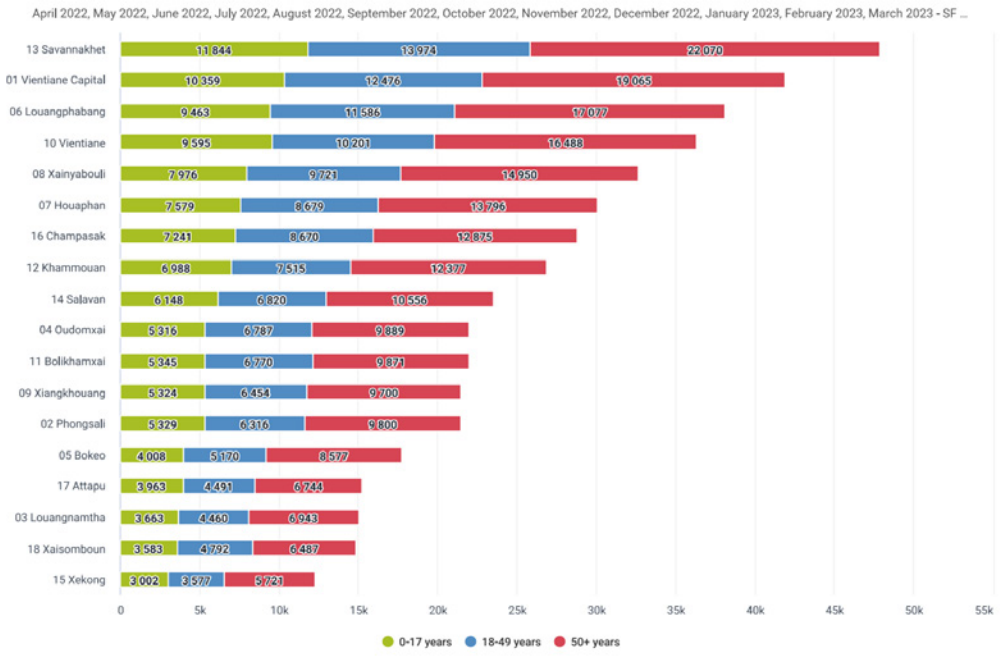
Ear and hearing – subnational and national decision-makers

A (sub)national level dashboard contains three sections: service use distribution and hearing loss; mastoid surgery for middle ear cholesteatoma; and newborn screening. This dashboard aims to display the results of collecting data for the same indicators as the previous dashboard but targeting analysis by subnational/national decision-makers. It is directed at national health authorities and subnational programme planners.

Service use distribution and hearing loss

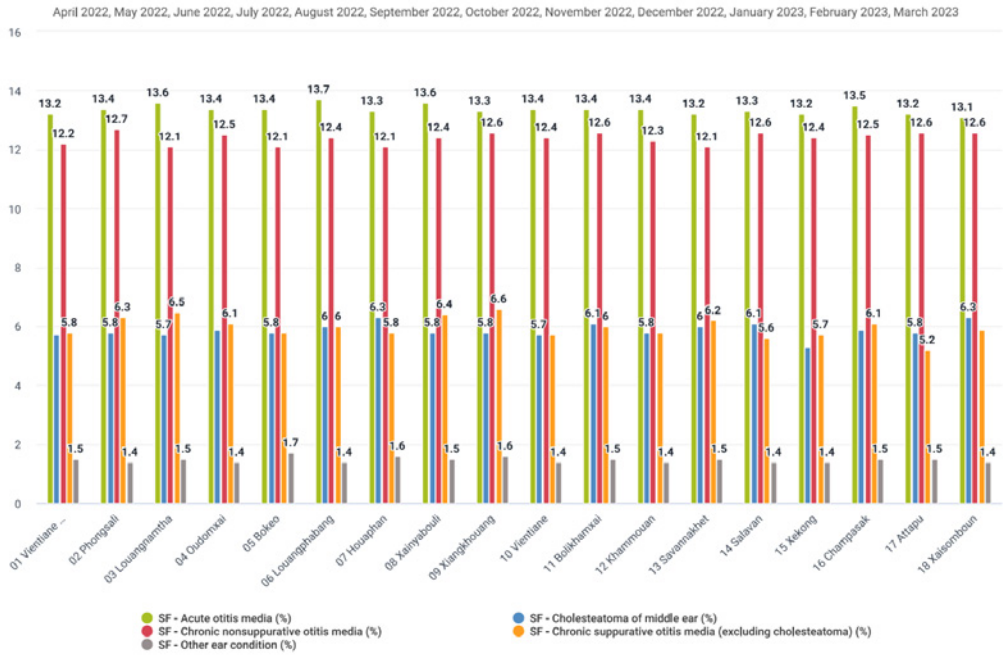
Visualizations and considerations for interpretation: The volume of ear and hearing care visits in the district reflects the national/subnational capacity to respond to the population's needs. The disaggregation by selected age groups aims to monitor the service use and assess time trends, allowing heath authorities or national programme planners to develop mid- to long-term planning that involves capacity-building measures (visualization 46).

Visualization 46: Number of ear and hearing care visits for selected age groups, by district, April 2022 – March 2023



The data for use of ear and hearing care services for specific categories of ear conditions at subnational level (visualization 47) informs on epidemiological trends, both locally and over time, and facilitates long-term planning of service delivery or awareness campaigns targeted at the most frequently occurring ear conditions.

Visualization 47: Percentage of ear and hearing care visits for selected ear conditions categories, by district, April 2022 – March 2023

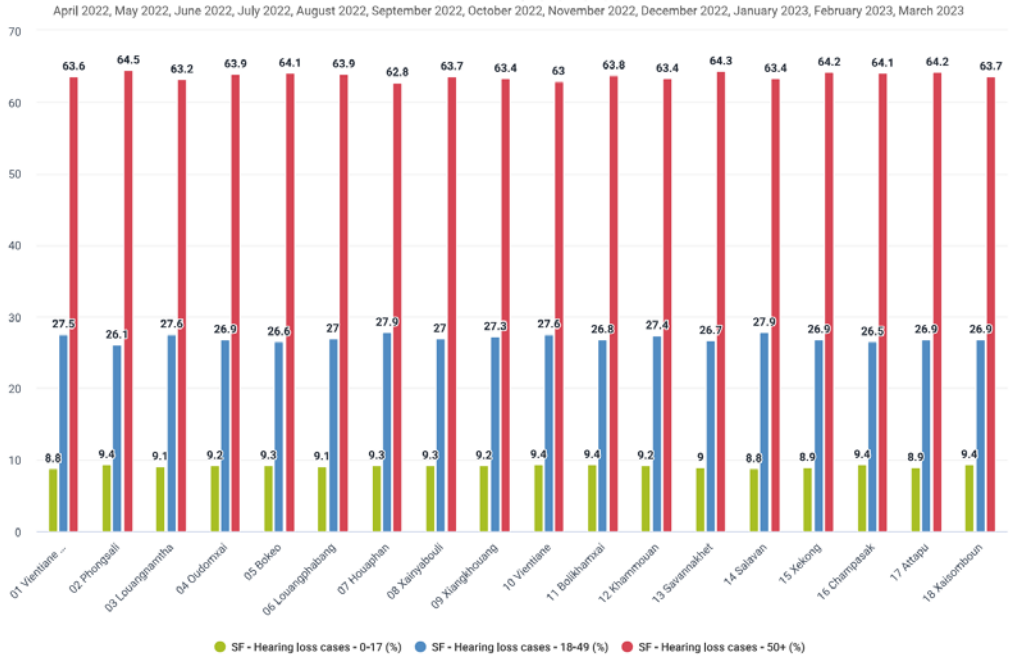


This dashboard provides the total number of cases of hearing loss per 10 000 population diagnosed among first visits to ear and hearing care services in the country (visualization 48). It also shows the distribution of cases of hearing loss according to the selected age groups at a subnational level (visualization 49).

The information allows real-time monitoring of people with hearing loss who access services; it further allows national health authorities to identify epidemiological trends that can affect service utilization and delivery, and to plan accordingly for ear and hearing care.

Visualization 48: Cases of hearing loss per 10 000 population diagnosed among the first visits in the country, April 2022 – March 2023

Visualization 49: New hearing loss diagnosis for selected age groups, for a selected district, April 2022 – March 2023



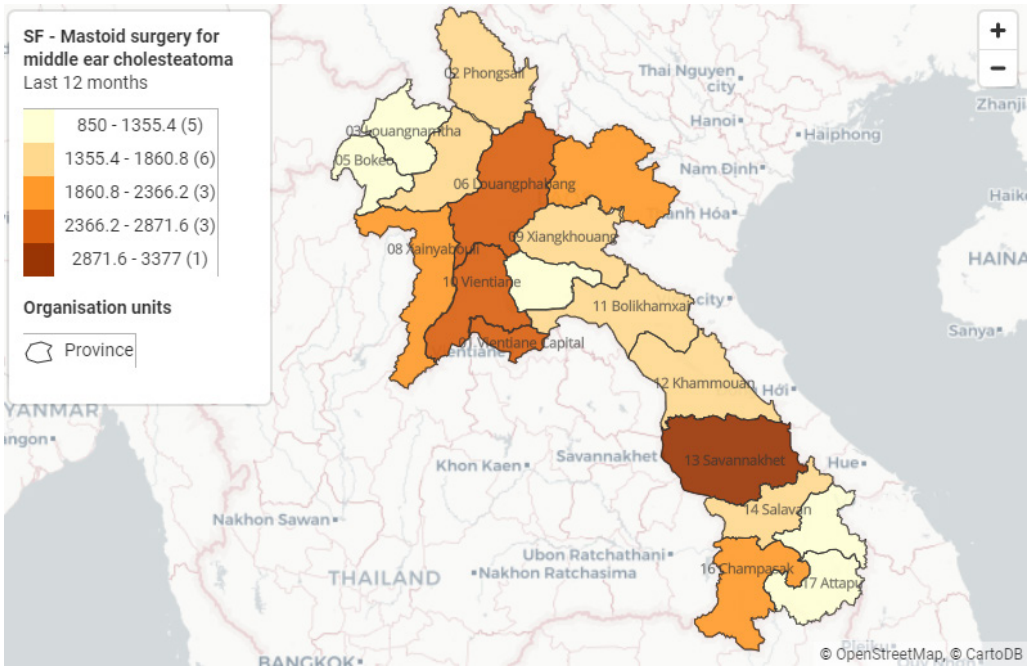
Mastoid surgery for middle ear cholesteatoma

Visualizations and considerations for interpretation: In many countries, the availability of specific ear and hearing care services, such as mastoid surgery for middle ear cholesteatoma, is concentrated mainly in urban areas. The dashboard has maps that locate facilities providing this surgery and the number of surgeries performed. Geographical equitable access can be assessed, and comparisons made of service availability for mastoid surgery for middle ear cholesteatoma that is provided by different facilities (Visualization 50) and districts (Visualization 51) within a country.

This information may be used by national health authorities to identify possible existent barriers in accessing this surgery, such as insufficient provision of services to meet demand. Additionally, the information can be used to assess the performance of the referral systems in place.

These visualizations allow an analysis of time trends at national and subnational levels to establish baselines and to monitor efforts towards achieving an equal national distribution. Health authorities and national programme managers should set their own national and subnational standards based on population needs.

Visualization 50: Distribution of number of mastoid surgeries for middle ear cholesteatoma, by district, 2022



Visualization 51: Timeline of number of mastoid surgeries for middle ear cholesteatoma, by district, April 2022 – March 2023

Mastoid surgery for middle ear cholesteatoma													
SF - Mastoid surgery for middle ear cholesteatoma													
	April 2022	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	Total
01 Vientiane Capital	254	203	233	246	216	246	245	230	216	244	280	233	2 846
02 Phongsali	137	152	157	97	114	146	109	128	130	86	69	98	1 423
03 Louangnamtha	104	82	71	86	110	86	85	84	76	105	93	80	1 062
04 Oudomxai	123	106	86	107	100	110	124	131	165	113	144	105	1 414
05 Bokeo	87	107	55	92	101	99	109	121	122	122	132	106	1 253
06 Louangphabang	219	219	213	226	210	221	196	265	173	168	209	225	2 544
07 Houaphan	185	179	135	206	144	198	132	166	195	126	165	115	1 946
08 Xainyabouli	196	194	196	182	194	179	200	184	183	189	211	201	2 309
09 Xiangkhouang	109	123	134	126	107	121	141	118	88	83	119	131	1 400
10 Vientiane	207	244	192	185	225	200	221	177	221	212	191	173	2 448
11 Bolikhamxai	124	102	138	144	98	119	123	125	112	96	131	126	1 438
12 Khammouan	137	120	121	131	177	169	119	176	165	171	105	165	1 756
13 Savannakhet	249	293	269	262	239	326	249	306	289	275	289	331	3 377
14 Salavan	130	119	137	130	110	102	153	161	145	149	169	136	1 641
15 Xekong	58	70	61	70	42	79	82	54	90	62	91	91	850
16 Champasak	151	197	159	130	217	168	159	207	153	140	155	219	2 055
17 Attapu	88	105	50	69	93	87	88	83	107	82	63	84	999
18 Xaisomboun	64	75	96	110	96	84	133	80	88	107	98	95	1 126
Total	2 622	2 690	2 503	2 599	2 593	2 740	2 668	2 796	2 718	2 530	2 714	2 714	31 887

Newborn screening and distribution

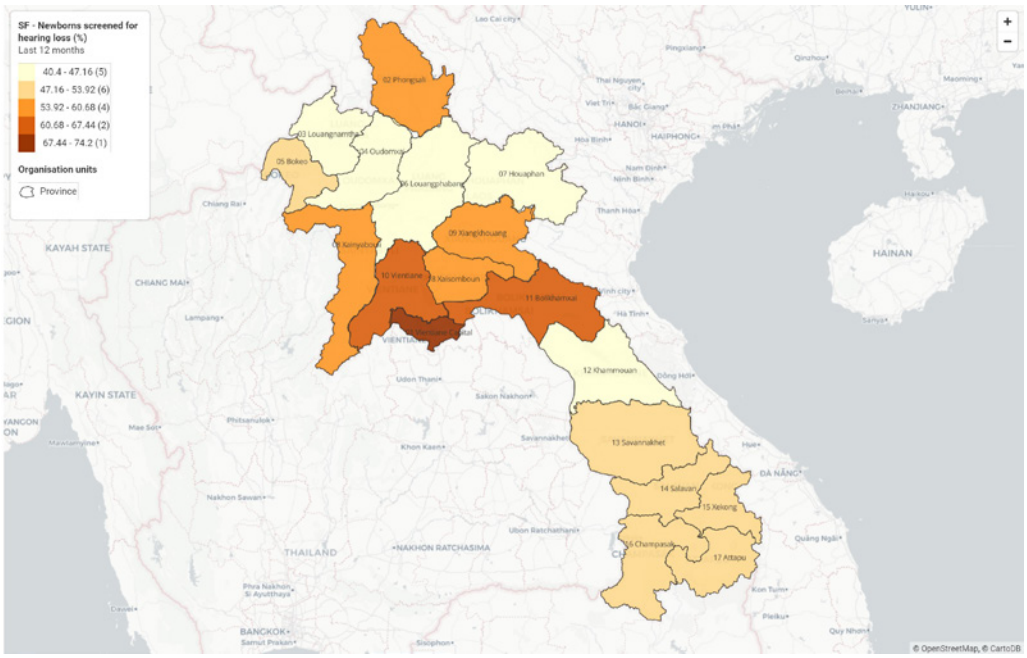
Visualizations and considerations for interpretation: In most countries, the availability of specific services, such as the screening of newborns for hearing loss, is concentrated mainly in urban areas. This dashboard should therefore be consulted to assess accessibility across geographical regions. Visualizations 52 and 53 show the percentage of newborns screened for hearing loss by district and by facility on a map; these can be used to assess equitable access across regions as well as to compare availability and accessibility across facilities that provide this service and report in HMIS.

National health authorities and programme planners may use this information to detect any issues relating to geographical coverage and, over time, for the monitoring of improvement measures for accessibility to this specific ear and hearing care service.

Visualization 52: Timeline of newborns screened for hearing loss (%) by district, April 2022 – March 2023

Newborns screened for hearing loss													
SF - Newborns screened for hearing loss (%)													
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	April 2023	Total
01 Vientiane Capital	7.3%	7.6%	7.9%	7.5%	8.3%	7.8%	6.4%	7.5%	7.4%	7.5%			7.5%
02 Phongsali	6.2%	5.7%	5.4%	5.2%	6.3%	5.8%	6.6%	5.6%	5.7%	5.3%			5.8%
03 Louangnamtha	5.6%	4.7%	5.4%	4.6%	5.8%	4%	4.1%	5.2%	3.9%	4.7%			4.8%
04 Oudomxai	4.3%	4.2%	4%	4.4%	4.9%	4.1%	4.4%	4.4%	4.8%	4.2%			4.4%
05 Bokeo	5%	6%	5.2%	5.6%	5.7%	5.4%	5.3%	5.5%	5.4%	5.4%			5.5%
06 Louangphabang	3.9%	4.5%	3.9%	4.4%	4.6%	4.2%	4%	4.4%	4.1%	4.8%			4.3%
07 Houaphan	4.8%	4.6%	4.5%	5.2%	4.7%	3.8%	5%	4.7%	4.5%	4.9%			4.7%
08 Xainyabouli	5.9%	6.2%	6.3%	6.6%	6.3%	6.6%	5.9%	6.6%	6.9%	6.9%			6.4%
09 Xiangkhouang	6.3%	5.6%	6.4%	5.5%	6.4%	5.6%	5.6%	5.7%	5.7%	6.2%			5.9%
10 Vientiane	7.3%	6.7%	7.1%	6.7%	7.1%	6.4%	6.5%	6.7%	6.4%	6.9%			6.8%
11 Bolikhamxai	6.8%	6.9%	6.9%	6.5%	6.2%	7.5%	6.6%	6.9%	6.2%	6.3%			6.7%
12 Khammouan	4.8%	5.3%	4.5%	5.4%	5.4%	4.8%	5.4%	4.9%	4.8%	4.8%			5%
13 Savannakhet	5.5%	4.7%	5.1%	4.9%	4.8%	5.6%	5.3%	4.8%	5.2%	4.9%			5.1%
14 Salavan	5.1%	5.2%	5%	5.1%	4.6%	4.8%	5.4%	4.9%	5.2%	5%			5%
15 Xekong	5.8%	5.3%	5.1%	4.7%	3.9%	5.3%	5.6%	5.3%	5.8%	4.5%			5.1%
16 Champasak	5.4%	5.8%	5.1%	5.8%	5.5%	6%	5.7%	5.6%	5.5%	6.1%			5.7%
17 Attapu	4.5%	5.1%	5.7%	5.3%	4.4%	5.9%	5.8%	5.9%	6.3%	5.5%			5.4%
18 Xaisomboun	5.5%	5.7%	6.3%	6.6%	5%	6.1%	6.3%	5.5%	6%	6.2%			5.9%

Visualization 53: Newborns screened for hearing loss (%), by district, 2022



Data limitations

A significant limitation in the analysis of aggregate data on eye and ear care collected by health facilities is that often the data are representative only of the services provided through the health facility and/or the individuals seeking for care. An advantage of health facility data to assess performance, as opposed to other data sources such as surveys, is that data are systematically collected for every individual receiving the service, and thus a comprehensive overview of service provision is provided. However, although the data collected by health facilities commonly inform on service utilization or quality, they are unable to inform on accessibility or attitudes and practices, and this may lead to data that are underreported or have biased coverage. In this way, it is recommended that analysis of routinely collected health facility data should be complemented by information from other sources, such as population/household surveys to uncover segments of the population that may be missing.

Another limitation in data analysis, in terms of service delivery or performance, is that data must be based on an understanding of the population served by a referral facility, or informed if there are any changes in the population catchment. Eye and ear care services are delivered at all levels of care and cover a wide range of interventions. The core facility indicators selected, focus on the most common interventions, and these are provided at secondary and tertiary levels of care. Analysis of the aggregate health facility information on eye and ear care must, in this way, consider that the subject analysed is usually referral facilities.

The recommended visualizations in the aggregate health facility data on eye and ear care dashboards attempt to represent the most useful ways to display the resultant information from the data collection.

When considering these limitations in data interpretation, users of the Routine Health Information Systems: sensory functions toolkit must contextualize the resultant information according to the setting, the actual service provision, and the needed levels of disaggregation.

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Annex.
Brief definitions

Workload: total number of visits, as the sum of first and the follow-up visits, divided by the number of workers.

Eye care professions:

1. **Ophthalmologist:** A specialist medical practitioner who diagnoses, treats, and performs non-surgical and/or surgical procedures on people with vision disorders and eye conditions.
2. **Optometrist:** A person with a recognized diploma or degree in optometry who provides detection/diagnosis, management, and treatment services for disorders of the eye and the visual system.
3. **Ophthalmic nurse:** a specialist nurse trained to assist in the diagnostic evaluation, treatment, management, and care of patients with deficiencies and abnormalities that affect their vision and the visual system.
4. **Orthoptist:** a person with a recognized diploma or degree in orthoptics trained to evaluate and treat disorders of the visual system with an emphasis on binocular vision and eye movement disorders.
5. **Other allied ophthalmic personnel:** an umbrella term often used to describe other eye care workers (e.g. ocularist, ophthalmic assistant, ophthalmic clinical officer, ophthalmic clinician, optical dispenser, optician, vision therapist, among others) who assist in the diagnostic evaluation, treatment, management, and care of patients with deficiencies and abnormalities that affect their vision and the visual system.

Selected eye conditions categories:

1. **Refractive error:** due to an abnormal shape or length of the eyeball, light does not focus on the retina, resulting in blurred vision. There are several types of refractive error: myopia, hyperopia, astigmatism or presbyopia.
2. **Cataract:** clouding of the lens of the eye, which impedes the passage of light.
3. **Vitreoretinal disorders:** any condition affecting the retina or the vitreous.
4. **Glaucoma:** progressive damage to the optic nerve. Initially, loss of vision occurs in the periphery and can progress to severe vision impairment.
5. **Disorders of the ocular surface, eyelid and lacrimal system:** conditions affecting the cornea, the conjunctiva, eyelid or lacrimal apparatus.
6. **Ocular trauma:** traumatic injuries or contusions to the eyeball, orbit or surrounding tissue, including a foreign body in multiple parts of the external eye.
7. **Other eye conditions:** These include all eye conditions that do not fit into the previous categories.

Vision status: divided in two categories, no vision impairment vs vision impairment or blindness. Typically, the classification of the vision impairment is based on the measure of visual acuity in one or both eyes. For this purpose, the threshold for defining the vision status is:

- no vision impairment – visual acuity of ≥ 6/12 in one or both eyes; or
- vision impairment or blindness – visual acuity of < 6/12 in one or both eyes.

Sum of the waiting days for surgery: total number of days to receive the surgery, from the day the patient is first registered for surgery to the surgery itself. Defined as the length in days that people wait for surgery, measured retrospectively.

Preoperative presenting visual acuity: measure of the preoperative unaided distance visual acuity; or, if spectacles or contact lenses are worn to the assessment, preoperative distance visual acuity is measured with the person wearing them. Divided into four categories according to the visual acuity.

Postoperative presenting visual acuity: measure of the postoperative unaided distance visual acuity; or, if spectacles or contact lenses are worn to the assessment, postoperative distance visual acuity is measured with the person wearing them. Divided into three categories according to defined visual acuity thresholds. Postoperative presenting visual acuity should be tested between 4 and 12 weeks postoperatively. Settings with poor follow-up after cataract surgery should consider early postoperative assessment of visual acuity.

Eligibility for retinopathy of prematurity screening: birthweight and gestational age with or without additional criteria for sickness, as determined by local guidelines.

Ear and hearing care professions:

1. **Ear, nose and throat (ENT) specialist:** ENT specialists are medical doctors who have received training in managing diseases of the ear, nose and throat and have a recognized degree or diploma.
2. **Audiologist:** Audiologists have undergone a training in audiology and have a recognized degree or diploma.
3. **Speech therapist:** Speech therapists have a recognized diploma or degree in speech therapy. In some countries, speech therapy forms part of audiology training.
4. **Audiology technician:** Audiology technicians support the provision of hearing care services by performing routine screening tests of patients, as well as fitting and adjusting hearing aids, and responding to patients' questions regarding their hearing devices.
5. **Other ear and hearing workforce:** Besides the cadres of service providers mentioned above, many others play significant roles in the provision of hearing care; these include audiometrists, dispensers of hearing aids, rehabilitation specialists, and community health workers trained in ear and hearing care.

Selected ear conditions categories:

1. **Acute suppurative otitis media:** Acute suppurative otitis media is defined as an inflammation of the middle ear which erupts suddenly and passes quickly. It is characteristic for a person to have acute suppurative otitis media behind a reddened eardrum.
2. **Chronic nonsuppurative otitis media NSOM):** Chronic NSOM refers to ear conditions synonymous with otitis media with effusion (OME). Chronic NSOM typically occurs following acute otitis media, when the fluid in the ear, formed by the infection, does not clear spontaneously. The tympanic membrane remains intact, but the middle ear is filled with fluid.
3. **Chronic suppurative otitis media (CSOM):** CSOM is a long-standing infection of the middle ear – usually with a duration longer than two weeks. CSOM involves a perforation in the tympanic membrane and active bacterial infection within the middle ear space which can last for several weeks or more. There may be sufficient pus to drain to the outside of the ear (otorrhea), or the purulence may be minimal and only visible on examination using a binocular microscope, unspecified.
4. **Cholesteatoma of the middle ear:** This is a problem in the middle ear when the skin of the eardrum grows into the middle ear. People with cholesteatoma may have foul smelling ear discharge and hearing loss. Cholesteatoma erodes the bones of and around the ear and can lead to life threatening complications.
5. **Other ear conditions:** These can include dry perforation of the tympanic membrane, tympanosclerosis, adhesive middle ear disease, otosclerosis, and tumours of the ear.

Degree of hearing loss:

1. **Mild hearing loss:** hearing threshold 20-34 decibel (dB).
2. **Moderate-moderately severe hearing loss:** hearing threshold 35-64dB.
3. **Severe or higher hearing loss:** hearing threshold 65dB or above.

Type of hearing loss:

1. **Conductive hearing loss:** This occurs when there is a problem conducting sound waves anywhere along the route through the outer ear, tympanic membrane (eardrum), or middle ear (ossicles).
2. **Sensorineural hearing loss:** With this type of hearing loss, the root cause lies in the vestibulocochlear nerve (cranial nerve VIII), the inner ear (cochlea), or the central processing centres of the brain.
3. **Mixed hearing loss:** This diagnosis refers to a mix of both conductive and sensorineural hearing loss.

Hearing technologies:

1. **Hearing aid technologies:** Hearing aids are devices that amplify and deliver sound to the ear in order to improve auditory function. They can be analogue or digital.
2. **Hearing implant technologies:** Cochlear implants, bone conduction and middle ear implants.

    2.1 A cochlear implant is a surgically implanted device that works by transducing acoustic energy into an electrical signal which is used to stimulate auditory nerve fibres.

    2.2 Bone conduction implants transmit sound to the inner ear through the bones of the skull, bypassing the middle ear.

    2.3 Active middle ear implants may be fully or partially implanted into the ear. They function by converting sound into kinetic energy, which directly vibrates the middle ear ossicles or transmits the vibrations to the inner ear.

World Health Organization
Department of Noncommunicable Diseases

20 Avenue Appia
1211 Geneva 27
Switzerland

https://www.who.int/health-topics/blindness-and-vision-loss
https://www.who.int/health-topics/hearing-loss

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