Review Article

Realizing the potential of routinely collected data for monitoring eye health services to help achieve universal health coverage

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ABSTRACT

In the recent *World Report on Vision*, the World Health Organization (WHO) highlighted the need to strengthen health information systems (HIS) for eye health, including data from population-based surveys and facility-based sources such as service and resource data. The report also outlined the importance of strengthening eye health to enable Universal Health Coverage. In high-income countries, facility-based data are increasingly used to monitor eye services and answer research questions, including under the banner of big data. While there are some examples of comprehensive and robust information systems for eye care in low- and middle-income countries (LMICs), the potential of facility-based data is yet to be realized in many LMICs. Here, we discuss the potential of strengthening the collection and use of facility-based data for eye health in LMICs to monitor Universal Health Coverage relevant aspects of service access, quality, and equity.

Keywords: Health information systems, Facility based data, Routinely collected data, Eye health monitoring

In the recent World Report on Vision, the World Health Organization (WHO) highlighted the need to strengthen health information systems (HIS) for eye health, including data from population-based surveys and facility-based sources such as service and resource data.[1] The report also outlined the importance of[1] strengthening eye health to enable Universal Health Coverage.[1] In high-income countries, facility-based data[1] are increasingly used to monitor eye services and answer research questions, including under the banner of big data.[2] While there are some examples of comprehensive and robust information systems for eye care in[2] low- and middle-income countries (LMICs), the potential of facility-based data is yet to be realized in many LMICs. Here, we discuss the potential of strengthening the collection and use of facility-based data for eye health in LMICs to monitor Universal Health Coverage relevant aspects of service access, quality, and equity.

FACILITY-BASED DATA FOR EYE HEALTH

A recent analysis of the evidence used to inform national eye care plans from LMICs found that population-based cross-sectional surveys were the most commonly cited evidence.[3] However, population-based surveys are prohibitively expensive for many countries, meaning survey data are not always available. Further, the data that are available may not be recent or may only include

a subnational sample and therefore provide an incomplete or biased picture. In contrast to data from surveys, most countries collect routine health facility data at the time services are provided.[4] These data are generally collected and processed at the facility and summary reports are sent to district authorities. Due to the ongoing collection from facilities across entire countries, facility-based data have the potential to provide numerous real-time indicators of service coverage and use across all participating health facilities.[5]

Unfortunately, the potential of facility-based data to inform eye health monitoring and planning at the national level is currently not being realized – in the recent analysis of national eye care plans, fewer than one in four countries cited facility-based data in their plans, while most recognized the need to strengthen this component of their HIS.[3] We used an online survey to explore these aspects in the context of cataract service indicators in a cohort of students enrolled in postgraduate eye care courses run by the International Centre for Eye Health, London School of Hygiene and Tropical Medicine 2017–2019. Participating students worked as clinicians or managers in an eye department that delivers cataract surgery in a LMIC ($n = 23$) from 12 countries – Cameroon, India, Kenya, Malawi, Malaysia, Mexico, Nepal, Nigeria, Sri Lanka, Tanzania, The Democratic Republic of Congo, and Uganda, from a mix of government ($n = 15$) and non-government ($n = 8$) services. Below we draw on the experiences of this cohort to discuss the key issues of collection, accessibility, reporting, and use of data on cataract surgery.

COLLECTION AND ACCESSIBILITY

Eye clinics tend to routinely collect data on a broad range of cataract service indicators disaggregated by sex, including outpatient consultations, a diagnosis of cataract, recommendations for cataract surgery, undergoing cataract surgery, and post-operative outcome. The widespread collection of these indicators was observed in our student cohort [pale

shading in Figures 1 a and b]. However, these data were not readily accessible, with few able to be collated in <30 min [dark shading in Figures 1a and b].

A particular gap was data on surgical outcomes, which nine out of 10 clinics in our cohort could not readily retrieve. This finding reflects a lack of accessible data on surgical outcomes more broadly.[6,7] In 2021, the World Health Assembly endorsed ambitious effective cataract surgical coverage targets[8] that require the quality of surgical outcomes to be improved and/or maintained over the coming decades. Therefore, we must develop and test strategies that enable clinicians, service planners, and policymakers to collect and use data to more readily monitor surgical outcomes.

In the era of the Sustainable Development Goals – which aim to leave no one behind – HIS must also strengthen inequality monitoring to understand the extent to which population subgroups with particular health problems are accessing services.[9] The *World Report on Vision* and the *Lancet Global Health* Commission on Global Eye Health both highlighted the multitude of social axes beyond sex/gender along which differential access to eye care is experienced in different contexts, including rural domicile, lower socioeconomic status, non-dominant ethnicity, Indigeneity, and low social support.[1,6] Results from our cohort suggest the ability to assess differential eye care outcomes in LMICs tends to focus on differences between women and men – among the clinics of our participants, sex-disaggregated data tended to be collected as frequently as aggregate data, although they were slightly less readily accessible [Figure 1b]. Other social axes were collected much less often – two-thirds of clinics collected data on urban/rural domicile and two in four collected data on marital status, but neither of these were readily retrievable [Figure 2].

Technology is commonly considered the solution to enable monitoring, but on its own is insufficient to translate collected data into usable knowledge. For example, when
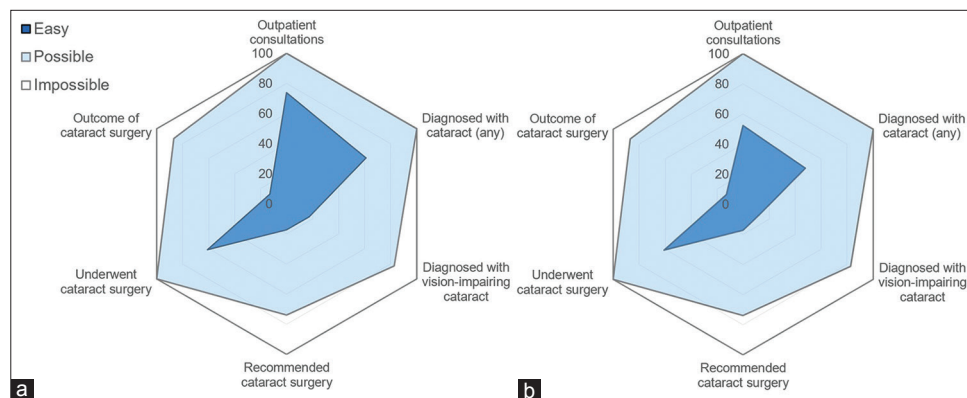
Figure 1: Accessibility of data on cataract services: (a) Aggregate and (b) disaggregated by sex. Easy: These data could be collated in a short amount of time (<30 min), possible: These data could be collated but it may take time, impossible: These data were not collected or unable to be collated.
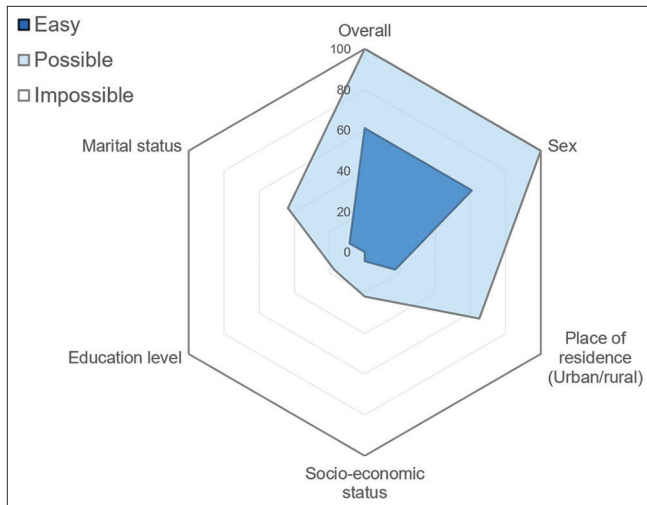
Figure 2: Accessibility of sociodemographic data on people undergoing cataract surgery. Easy: These data could be collated in a short amount of time (<30 min), possible: These data could be collated but it may take time, impossible: These data were not collected or unable to be collated.

our cohort was asked how their monitoring system could be strengthened, the most frequent suggestion was related to the system of data capture (e.g., computer, database, and internet connectivity). However, while three-quarters of our participants worked in clinics with computers and half had reliable internet, only one-third of clinics entered data about cataract surgery onto the computer. This highlights that beyond technology improvements, HIS strengthening also requires a combination of strategies to improve the collection, perceived value, interpretation, and use of data at facility, district and national levels.

REPORTING AND USE

Collected data are only useful if they guide decisions and action. The disconnect between data collection within facilities and subsequent use in planning is a major challenge in many LMICs, and there tends to be low demand for eye care data to guide decision-making across the different levels of the health system. For example, despite sex-disaggregated data being universally collected in eye clinics and population-based surveys, the recent analysis of national eye care plans found only one in 10 plans included a sex-/gender-based target.[3]

Research is needed to explore whether and how data on eye care delivery are collated and used for decision-making at different levels in the health system, and how this can be strengthened within the broader framework for health system strengthening. In our student cohort, one quarter worked in clinics that did not collate their data into a monthly report or similar, and approximately one in six participants whose clinics sent reports to stakeholders at the facility, district

or national level could not describe a way in which the information was subsequently used.

A major reason why decision-makers and service providers rarely use facility-based data for planning is because of issues with inaccuracy and incompleteness of the data, as well as having insufficient tools and skills to effectively collect, analyze, synthesize, and interpret the data.[9,10] There is a need to evaluate strategies to strengthen the process of monitoring eye care services in different contexts. Audit and feedback are one such strategy, with effective methods of how to improve professional practice generally[11] and to strengthen HIS specifically.[12,13] Indeed, methods developed by the WHO for data quality review for other areas of health[14] could be modified and applied to eye care indicators. Within our cohort of students, there was appetite for capacity building to make better use of information at the facility level to guide action, but we recognize that this may not be a universal attitude in LMIC eye facilities.

The UK has used routinely collected information to monitor and improve the dimensions of access, quality, and equity of cataract and diabetes eye care services at a national level.[2,15] There are lessons to learn from the UK as well as non-eye health experiences in LMICs to establish a process whereby routinely collected data can contribute to generating the evidence required to realize eye health for all.[5,16] In some settings with appropriate infrastructure, further benefits may be possible through the use of electronic medical records,[17,18] though additional potential challenges need to be considered.[19,20] In addition to the tools available to assess data quality and completeness,[14] there is also guidance to ensure completeness of reporting (RECORD statement: Reporting of studies Conducted using Observational Routinely-collected Data).[21]

CONCLUSION

As outlined in the *World Report on Vision*, strengthening HIS for eye care is essential to fully enable equitable, high-quality eye care as part of Universal Health Coverage.[1] Taking cataract services as an example, eye clinics in LMICs commonly collect data that could help to monitor progress toward Universal Health Coverage. We believe that the potential of these data and eye care data more generally could be realized through improvements in four key areas – optimize the use of appropriate technology so that data are readily accessible; implement training on data quality as well as audit and feedback; build the capability of surgeons, eye care service managers, and decision-makers to analyze, interpret, and use routinely collected eye care data; and collect additional indicators of inequality.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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