

# VISION FOR A NATION

## Remote validation of monitoring data

7 October 2016

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## List of abbreviations

M&E	Monitoring and Evaluation
MoU	Memorandum of Understanding
MoH	Rwanda Ministry of Health
HMIS	Health Management Information System
PEC	Primary Eye Care
RBC	Rwanda Biomedical Centre
VFAN	Vision for a Nation

# Executive Summary

Vision for a Nation's Primary Eye Care (PEC) programme in Rwanda operates a relatively straightforward standalone data collection system that provides monitoring data to inform operational and management decisions and give an account of the roll-out of the PEC programme.

INTRAC was commissioned to review the monitoring data and a proposal was made to undertake this in two phases, one remote and one – if required – in the field. This remote phase of M&E data review found that VFAN are collecting appropriate data for the **purpose** of managing and reporting on the roll-out of the PEC programme. The focus is primarily on monitoring the quantities of programme outputs. There may be a case for exploring measures of programme quality as the roll-out is complete and the programme matures and to extend M&E systems to look at questions of outcomes and impact. More generally, it would be useful for VFAN to document its existing monitoring and evaluation system in a way that clearly sets out the purpose of data collection in relation to programme objectives, methods used and definitions of indicators.

The **process** of data collection operates smoothly, particularly given that it relies of close cooperation of Ministry of Health (MoH) staff. This appears to reflect both the relative efficiency of the MoH itself and the strong relationship that VFAN has with the ministry at high level and within districts. The recent departure of the Health Minister has not affected the ongoing data collection, despite a hiatus on other communication channels with the MoH.

The **data** collected show a high degree of integrity, being remarkably complete given the context and process, and requiring little cleaning before use. In terms of internal consistency of the indicator set, this phase found no issues with the majority of indicators. However, a potential inconsistency between the definition and recording of eye-screenings at health centres was identified. The effect of this may be an under recording of eye screenings actually taking place, or alternatively, a need to clarify the way in which 'screenings' take place alongside reporting. We recommend VFAN explore this further through consultation with programme staff and/or field verification.

The question of external validity of data – by which we mean the indicators truly reflect what the purport of measure on the ground – could not be addressed in this remote phase. At the outset of this exercise, it was expected that the Rwanda programme was using data collected via the MoH health management information system (HMIS). This was found not to be the case with the exception of ad-hoc requests to the ministry. The lack of access to these data has meant it has not been possible to triangulate VFAN's own standalone monitoring system; field verification would therefore be recommended to provide a view of the extent to which the indicators reflect what they purport to measure. When feasible, it could be useful for VFAN to access the ministry HMIS data more systematically in order to triangulate their own indicators collected via standalone monitoring system, although the HMIS only covers a small number of the indicators VFAN uses.

# 1 Introduction

Vision for a Nation (VFAN) implements a Primary Eye Care (PEC) programme in Rwanda in close cooperation with the Rwanda Ministry of Health. INTRAC was commissioned to review and validate the monitoring and evaluation (M&E) data that VFAN collects and uses to support its programme in Rwanda.

The data validation is intended to provide VFAN with an assessment of the quality of data that may be used in future evaluation work<sup>1</sup> and support development and improvement of VFAN's M&E systems. The data validation was conceived in two phases: (1) a remote phase to examine the integrity, internal validity and, if possible, triangulate the data externally. (2) a field verification exercise to address the question of external validity and explore any potential issues identified in the first phase. This report presents findings from a first phase of data validation; recommendations for a potential field verification phase are also presented.

The remote validation has involved detailed analysis of a sample of M&E data, as well as contextualisation of that data via interviews with key members of VFAN staff and document review.

## 2 Background

### 2.1 VFAN's primary eye-care programme

#### Programme overview

VFAN operate a Primary Eye Care programme in Rwanda in partnership with the Rwandan Ministry of Health (MoH). The programme consists of two main interventions:

- Training nurses to conduct primary eye-care assessments (hereafter referred to as screenings)
- Provision of subsidised glasses – these are provided by VFAN at zero cost, and are then sold to patients at a low cost, with revenue being retained by the MoH.

The programme operates via two modalities: health centre-based screenings (which are demand-led), and an outreach programme that screens people village-by-village. The former started in 2008 and now extends to all government-run primary health-care facilities in the country (c. 500 health centres overseen by 42 district hospitals). The outreach programme started in September 2015 and has reached 1,291 villages, as of June 2016. The reach is expected to grow to all health centres over the coming years.

VFAN's Rwanda programme operates in close cooperation with the Rwanda MoH, and a Memorandum of Understanding (MoU) between the two parties governs its activities, and mandates the support that VFAN receive from government health staff.

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<sup>1</sup> VFAN is currently commissioning

### Screening process

Nurses are trained to screen clients for eye conditions, and if a condition is identified, a primary treatment is prescribed or a referral for secondary treatment made. If the patient has no eye problem, they are offered preventative counselling for common problems. Glasses are low cost, but not free, so patients may not necessarily take up prescribed glasses.

Condition	Primary treatment offered
<b>Conjunctivitis (bacterial)</b>	Antibiotic eye drops (Tetra, CAF, Genta)
<b>Conjunctivitis (allergic)</b>	Chromosol eye drops
<b>Refractive error</b>	Reading Glasses Adjustable glasses
<b>Other eye conditions (e.g. cataract, glaucoma)</b>	Other medications or referral to secondary and tertiary services
<b>None</b>	Counselling

In health centres, screenings are administered depending on the presentation of the patient. There is no universal screening process (i.e. of patients not presenting with eye problems) in health centres themselves. However, the outreach programme screens available people in a village settings and VFAN targets a minimum of 100 screenings per village.

### Monitoring and evaluation

VFAN does not have an explicit M&E strategy, but the approach can be characterised as falling under two main areas:

1. Collection of quantitative monitoring data from the health centres that have received training of nurses and glasses, and the outreach programme.
2. Periodic discrete research and evaluation exercises, such a study of the impact of glasses provision to presbyopic women on handicraft productivity, a cost-benefit analysis of the PEC interventions, and a more detailed impact evaluation currently being undertaken by the London School of Hygiene and Tropical Medicine.

The former, rather than the latter is the focus of this report, although the cost-benefit study uses VFAN's monitoring data for grossing up the estimates of costs and benefits. Monitoring data is collected primarily for the purpose of programme management and secondarily for accountability to donors and/or Rwandan Ministry of Health.

At the outset of this validation exercise it was expected that the monitoring data used by the Rwanda programme derive both from the Ministry of Health's system (HMIS, described later), and VFAN's own data collection. However, early in the process it became clear that VFAN's Rwanda team does not have day-to-day access to HMIS, and have not pursued it as an M&E data source since it does not capture the full range of indicators VFAN's programme requires. The Rwanda country programme therefore relies almost exclusively on its own data collection exercises (which are facilitated by MoH staff at district hospital level).

The data allow the Rwanda Country Director to monitor the number of screenings taking place, the conditions diagnosed, the number glasses and other treatments prescribed (or referrals made) and provide additional support or capacity development where primary eye-care screenings are not proceeding as expected.

The monitoring data is also used as a public-facing website, so also support marketing and public fundraising and accountability to some extent. While VFAN had produced annual accounts, it has not until this year produced an annual report. VFAN is now undertaking a more holistic annual reporting process into which the monitoring data is feeding]

## 2.2 Rwanda health system

### Overview

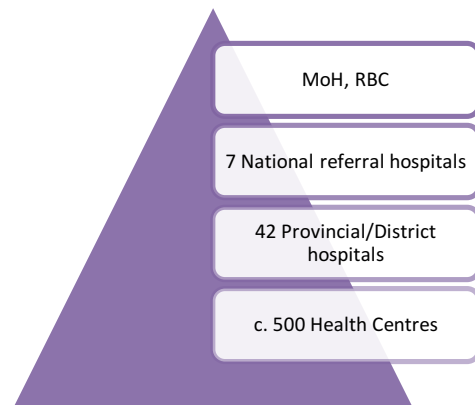
The Rwanda health system has enjoyed substantial investment over the last 15 years, both government budget via international donors. This has contributed to very significant improvements in key health outcomes such as maternal and child health, HIV/AIDs and malaria.<sup>2</sup> Rwanda's health sector mainly consists of government provision, with a community-based insurance system that aims to reduce the financial barriers to health-access for the predominantly poor and rural population.<sup>3</sup> Private health provision is relatively low in Rwanda, and is not included within VFAN's programme.

With the exception of VFAN, which focusses on primary eye-care, and the Australian Fred Hallows Foundation, which focuses on secondary treatment, eye-related conditions have not been a focus of special health programmes in Rwanda. This is despite eye-conditions being among the top 10 causes of morbidity in health centres, and the second most common reason patients attend secondary health care.<sup>4</sup>

### Structure

State health infrastructure in Rwanda is primarily structured by district, with 1 or more hospitals in each of the 30 districts (plus 4 national referral hospitals in Kigali). Provincial/District hospitals report direct to the Ministry of Health.

There are around 500 primary Health Centres which come under the remit of one of the 42 district hospitals. A small number of other types of institution (e.g. police or prison hospital are also present).



The Ministry of Health is supported by the Rwanda Biomedical Centre (RBC). Established in 2011, the RBC is the result of a consolidation of about 14 institutions,

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<sup>2</sup> World Health Organisation 'Rwanda: WHO statistical profile', 2013

<sup>3</sup> Abebe Shimeles, 'Community Based Health Insurance Schemes in Africa: The Case of Rwanda', 2010.

<sup>4</sup> Rwanda Ministry of Health statistical booklet, 2014

including those managing key programmes like the HIV/AIDS, malaria, and maternal and child care programmes. It also subsumed CAMERWA<sup>5</sup>, the central agency responsible for health procurement and distribution. The RBC is important for VFAN's programme as it oversees the procurement and distribution of glasses to health centres.

#### Health information system (HMIS)

Prior to 2008, Rwanda health information was largely paper-based with a number of discrete electronic systems for specific purposes (e.g. TracNet which dealt with HIV/AIDS). Integrated Health Systems Strengthening Project, backed by USAID, sought to integrate and upgrade the various systems.<sup>6</sup> In 2012, the project saw the Ministry of Health launch a single integrated electronic health information system to replace paper-based reporting, known as HMIS. This is a web-based system, where data entry is done at each health facility via a web portal, and data is stored in a single centrally-managed database overseen by the ministry of health. Patient level data is not recorded in the HMIS.

Two previous reviews of data quality in of Rwanda's HMIS (neither specific to primary eye care) were identified:

- Marie Paul Nisingizwe and others, 'Toward Utilization of Data for Program Management and Evaluation: Quality Assessment of Five Years of Health Management Information System Data in Rwanda', *Global Health Action*, 7.0 (2014) <<http://dx.doi.org/10.3402/gha.v7.25829>>.
- Karengera Innocent and others, 'Quality and Use of Routine Healthcare Data in Selected Districts of Eastern Province of Rwanda', 4.4 2 (2016), 5–13.

Both of these studies found that the overall data quality in the HMIS was relatively high, particularly with regard to completeness of data. One study raises some concerns about the consistency of the data over time, but this could simply be a reflection of real-world changes in uptake.

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<sup>5</sup> Centrale d'Achats des Médicaments Essentiels Consommables et Equipements Medicaux du Rwanda

<sup>6</sup> USAID & Rwanda Ministry of Health (xxxx): The Rwanda Health Management Information System.

## 3 Methodology

This remote phase of the data verification involved review of background documentation, key informant interviews with VFAN staff and descriptive analysis of a sample of monitoring data..

### Document review

The following external documents informed this review:

- A scan of literature on Rwanda HMIS system, focussing on data quality assessments that highlighted two studies.
- Background information on Rwanda's Integrated Health System Strengthening programme
- Rwanda Ministry of Health Annual statistical booklet (latest is 2014)

In addition, the following reports commissioned by VFAN were reviewed:

- A study by Tufts university on the impact of using glasses for presbyopic women on their productivity at producing handicraft goods
- A cost benefit analysis of VFAN's PEC programme by Croock Associates
- Terms of Reference for upcoming Impact Assessment, to be conducted by the London School of Hygiene and tropical medicine.

### Key informant interviews

Remote interviews and follow-up calls were conducted with the following:

- VFAN Rwanda Programme Country Director and VFAN Foundation Strategy and Communications Director
- Members of the VFAN M&E team in Rwanda (group interview)
- Rwanda Programme Senior M&E Data Analyst
- The lead of a forthcoming impact evaluation of VFAN's PEC programme, to be conducted by the London School of Hygiene and Tropical Medicine

Insights from a pre-contract call with VFAN Foundation's Chief Executive have also been taken into account in framing this review.

### Analysis of monthly reports

VFAN receives monthly reports from district hospital data managers who collate reports from the health centres within their jurisdictions. The monthly reports cover all screenings, so include health centre-based and outreach programme. VFAN itself does not compile these raw reports into a single database.

Two monthly cross-sections of VFAN's monthly reports were therefore purposively selected for data analysis:



- May 2016, because this is 1 month behind the most recent data available (where some hospital referrals data was still pending).
- September 2015, because this provides a reasonable time-span between the two points, and a chance to review data collected in the previous iteration of the reporting template.<sup>7</sup>

Data were sought from all districts for the above months and these were compiled into a database comprising 860 monthly reports (termed the two cross-sections in the remainder of this report). In practice, a much larger time-span of data was provided for some districts and this was exploited as a double check of the cross-section datasets.<sup>8</sup>

#### Analysis of weekly reports

In addition to monthly reports, VFAN receives weekly reports from health centres via hospital data managers for the outreach programme only. These are compiled into a database by VFAN, which at the time of analysis contained 5,177 weekly reports, covering 15 districts from September 2015 to July 2016. There was secular growth in the number of health centres participating in the outreach programme and hence providing data through this time-frame. This dataset was compared with the sample of monthly reports to enable disaggregation of the health centre-based and outreach programme modalities.

#### Limitations

This remote phase was intended to review the integrity, internal consistency and triangulate the monitoring data that VFAN collect to provide an indication of the external validity of the indicators collected (by which we mean the extent to which the indicators reflect the reality on the ground). The main unanticipated limitation was that triangulation of data was not possible. It was anticipated that some indicators that VFAN collects could be compared with those collected via the Ministry of Health's information system (HMIS). However initial interviews after inception of the review revealed that VFAN has limited access to the HMIS. Furthermore, the recent departure of the minister of health has led to something of a hiatus in the lines of communication with relevant parts of the ministry. It was therefore not possible to request data for the purpose of triangulation. In its absence, the external validity of VFAN's data was not possible to verify. The implications are discussed further in the next section.

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<sup>7</sup> A new monthly report template was implemented from October 2015, providing more detail on diagnoses, prescriptions and slightly altered age-banding.

<sup>8</sup> In total, between September 2015 and May 2016, 2,488 monthly reports covering all but one district outside Kigali were received. For the period January 2014 to September 2015, 4,799 monthly were received.

## 4 Results of data verification phase 1

This section presents the results of the remote review and verification of VFAN's M&E data.

The results cover three main lines of inquiry:

- Are the right being collected, given the purpose?
- Are data being collected the right way?
- Are the data right (in terms of data integrity, internal validity and external validity)

### 4.1 Is appropriate data being collected?

The indicators VFAN collects via its standalone monitoring system mainly capture the **quantity** of key inputs and outputs of the programme. VFAN's indicator set does not currently capture the **quality** of inputs and outputs, nor **outcome** measures.

- ✓ The quantity indicators set out appear to provide a clear picture of the programme, with no obvious gaps. The improvements in 2015 to the monthly reporting template added significant useful information.
- ✓ Outcomes and impact of VFAN's interventions appear better served by periodic evaluation exercises than by ongoing monitoring.
- > VFAN may wish to explore indicators of programme quality if the LSHTM impact evaluation shows weaker outcomes than expected. Assessing the knowledge/capacity of nurses before and after training/refreshers may be useful in this regard.
- > To support replication and sustainability of the programme, it may be useful to document the existing M&E system in relation to the purposes it serves.

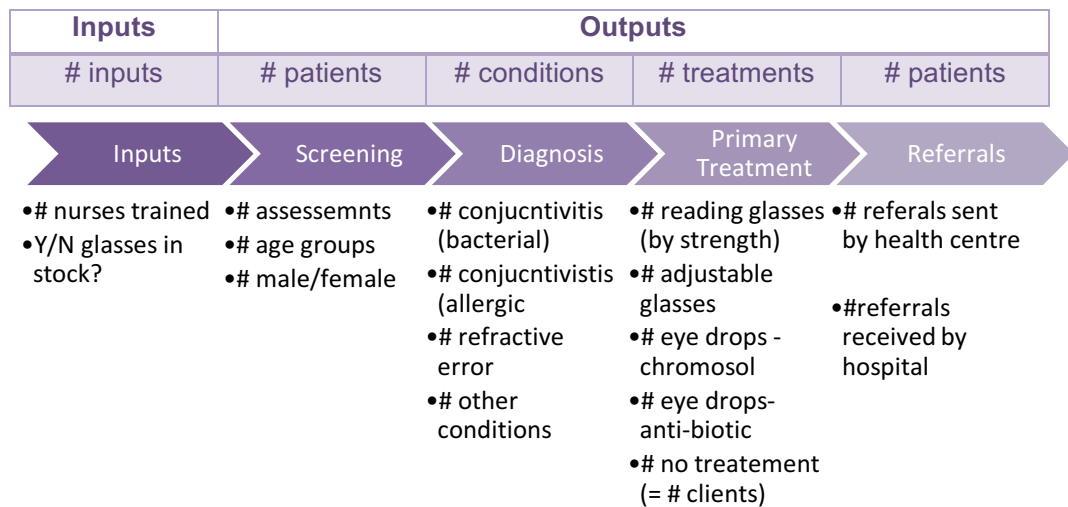
#### Purpose of VFAN's M&E system

VFAN does not have a formal documented M&E framework that clearly sets out the purpose of data collection. Interviews with VFAN staff indicate that the primary purpose of data collection is to inform Rwanda programme management and oversight. While UK-based staff receive aggregate figures, it is the Rwanda country team that review monthly and weekly reports and use them in programming decisions. The monitoring data does serve secondary purposes of reporting and accountability for activities undertaken and is referenced on VFAN's public-facing website. Outcomes and impacts of VFAN's programme are assessed via discrete studies rather than regular M&E data collection.

#### Quantity of inputs and outputs

VFAN's indicators measure the quantities of key inputs (training of nurses, and stocks of glasses) and then trace the outputs of the PEC programme at each step of primary care: screening, diagnosis, primary treatment and referral for secondary services. The set of indicators therefore represent a coherent programme logic. Interviews with VFAN staff indicate that counting methods differ for different stages of

the process: some indicators count number of patients while others track number of conditions/treatments, such that one patient may have multiple diagnoses and treatments or none at all.



A detailed list of indicators is given at **Annex A**. The current indicator lists reflects a more detailed reporting template that was introduced in October 2015. This disaggregates the single conjunctivitis into bacterial/allergic, altered the age-banding, broke down reading glasses purchased by strength, and added an indicators to capture the numbers receiving no treatment (but were offered counselling). The number of screenings resulting in no treatment is particularly important to track, as it allows VFAN to understand the diagnosis and treatment rate which cannot be deducted from other indicators due to the different counting methods.

**Inputs: stocks of glasses**

While the specified indicators for stocks of glasses require a simple YES/NO response, we found that over 60 per cent of health centres actually report the exact quantity of glasses in stock. Changing the guidance for these indicators to quantity measures might allow VFAN to track stocks of glasses at a more disaggregated level, and potentially support intervening earlier if/when supply chain problems are suspected.

Quality of inputs and outputs

VFAN does not currently capture any measures of **quality** in the data it collects from health centres. Such measures might include, for example, knowledge retention after nurse training (informing training techniques) or observation of correct/incorrect diagnoses in health centres or during outreach (informing training content and frequency). Measures of quality are often more challenging and resource intensive to administer, and a monitoring system should strike a balance between collecting sufficient data to inform decision-making, and avoiding undue burdens as a result of data collection, In VFAN's case, the effects of programme quality (good or bad) will be reflected in periodic evaluation studies rather than ongoing monitoring. However, should future evaluations highlight unexpected results, the question of *measuring* quality may become more important to measure on a wider and more frequent basis than periodic evaluations allow.

### Outcomes and impact

As previously noted, VFAN addresses programme outcomes via periodic research and evaluation studies (such as the impact evaluation by LSHTM, and the productivity study), rather than ongoing monitoring. Monitoring outcomes regularly, given the programme context, would be impractical due to the resources required.

Monitoring of outputs in VFAN's standalone system begins after nurses have been trained. However, there would be an opportunity to relatively inexpensively measure the effectiveness of capacity building by assessing nurses' knowledge of primary eye-care before and after initial trainings or refreshers. Such measures would enable VFAN to make an assessment of the *additional contribution* VFAN's capacity building had made.

## 4.2 Is data being collected in the right way?

- ✓ A standalone monitoring process involving monthly and weekly reports appears both necessary and proportionate.
- ✓ The process operates relatively smoothly and efficiently and VFAN's cooperation with the Ministry of Health appears to enable this.
- Weekly reports do not record the numbers with no eye-condition following screening (i.e. those offered counselling), therefore this indicator cannot be disaggregated for outreach and health centre based programmes.

### Data collection

While the MoH (via HMIS) collects a small number of indicators related to eye-care from health centres, VFAN relies almost exclusively on a stand-alone data collection process. The rationale for a standalone process is that the MoH data do not cover the necessary indicators. The HMIS records only new cases (i.e. diagnoses) and therefore provides no data on the number of screenings, types of treatments, and demographic profile of those screened. Interviews with VFAN staff suggest that the MoH is keen to keep the number of indicators routinely collected via the HMIS to a manageable level. It has already reduced the number of core indicators it collects to around 500 and is resistant to increasing this indicator set.

Nevertheless, the standalone process operates in close cooperation with the MoH and, in particular, the 42 district hospital data managers who coordinate health centre-reporting and transmit data back to VFAN, as outlined below. Considering the reliance on ministry of health staff to coordinate and transmit data, the process operates smoothly and provides VFAN with timely information on a weekly and monthly basis, as discussed below.

### Monthly primary eye-care reports (health centre and outreach)

VFAN's monitoring system is centred around a monthly reporting cycle, coordinated through the data manager at each district hospital. VFAN has developed health centre and district hospital level reporting templates, reflecting the indicators they

require. When an eye-screening is carried out in a health centre, or during an outreach visit, this is recorded on paper-based patient-level log-book held at the health centre. On a monthly basis, health centre staff review the patient records and complete the reporting template that is sent to the data manager at the relevant district hospital. The data manager checks and collates these health centre level data, adds in referrals data from the hospital, and then sends a report to VFAN electronically via a standardised template.

VFAN receives 42 separate reports each month, one from each district hospital, containing the health centre level aggregate data. These data include both the health-centre based and outreach programmes. The process, end to end, is summarised in Table x.

**Table x: Data collection process for monthly reports**

Level	Process	Who?	When?
<b>Patient level</b>	After every eye screening, patient records are recorded in paper files held at the health centre. These are recorded according to MoH standards, rather than VFAN	Health centre Nurses either in clinic or during outreach	at the time of screening
<b>Health centre level</b>	Patient level data is aggregated by each health centre and recorded on VFAN template	Health centre staff	Monthly
<b>District Hospital Level</b>	District/provincial hospitals request VFAN templates from health centres. Hospital data managers conduct their own checks and follow-up	District Hospital data managers.	Monthly
<b>District Hospital Level</b>	VFAN M&E team request reports from each from the 42 district/provincial hospitals	VFAN M&E team	Monthly
<b>District and National level</b>	VFAN extract key indicators from each district hospital report to generate national level indicator set	VFAN M&E team	Monthly

VFAN's M&E team report that by-and-large this process operates smoothly, and while they may have to chase some data managers to submit reports, overall the data submitted each month is largely complete. Analysis of the monthly reports substantiates this: while there are occasional gaps in health centre reports for particular months, the analysis shows these are a very small fraction (less than 0.5%) of the total and a number of these are explained by absence of trained staff (hence no screenings etc. took place during that month).

### Weekly report (outreach only)

VFAN operates a parallel weekly reporting system for the outreach programme. This draws on exactly the same patient level records as the monthly reports, but contains a slightly smaller set of indicators for the outreach cases only. This serves the function of enabling real-time tracking of the more recent outreach programme, and also enables the outreach cases to be disaggregated from the monthly reports.

The outreach reports do not attempt to document any context-specific details of the outreach programme, for example, the timing of visits to villages (which may affect who can access screenings). Such data could be useful in exploring issues of quality and may be worth exploring if any quality concerns come to light via evaluation exercises.

### Log of nurses trained

A running log of nurses trained and their contact details is kept by VFAN. As noted earlier, there may be opportunities to monitor the capacity of nurses at the point of training.

### Data checks and management

- ✓ Data is checked at critical stages and data checking and management processes appear sufficient given the use of the data.
- > VFAN relies solely on MoH checks at health centre level. It does not have specific sense-checking processes, instead M&E staff rely on “rules of thumb”. While this appears to be working, it could be useful to more develop systematic ‘sense checks’ to enable the M&E team to spot potential outliers more easily.

VFAN’s monthly and weekly reports draw on the paper records that health centres keep; these are informed by MoH data collection protocols and standards. VFAN itself does not carry out detailed checks on data quality at health centre level – instead relying on the hospital data managers to do so. District hospital data managers are in any case, required by the ministry to conduct monthly checks to ensure data recording is in line with ministry protocols. This phase of the review has not assessed the accuracy and consistency of patient level recording, which would require field verification.

VFAN’s Rwanda M&E team perform checks at the district level, by reviewing each monthly report when it is received. Reviews involve:

- Check that all health centres are included
- Check that indicators are recorded according to guidance
- Sense check on key indicators (for example unusually low or high levels, or ratios between the indicators)

Any queries are phoned through to hospital data managers. Once queries have been dealt with, the monthly data is then stored on a shared drive in separate folders. The aggregate indicators at district level are then transcribed into a separate database of performance data.

The same process is repeated for weekly reports, except that these are compiled into a single database. There may be a case for VFAN to compile monthly reports into a single database so that future requirements for new aggregate performance indicators could more easily be met.

Dataset	Storage / management
<b>Nurses database</b>	Single excel spreadsheet
<b>Monthly primary eye care reports</b>	Individual district hospital reports filed by month/year stored on a shared drive
<b>Performance data</b>	An aggregate dataset at district level covering key indicators, derived from the monthly PEC reports.
<b>Weekly outreach only reports</b>	Compiled into a single excel database

### 4.3 Are the data valid?

This section presents the results of detailed remote analysis of VFAN's monitoring data. Overall, a comprehensive data validation would encompass three levels:

- a. **Integrity** of the data – this refers to whether it is complete and free from errors – which refers to the mechanics of data recording and transfer.
- b. **Consistency and reliability of indicators** – this refers to the degree to which indicators are consistent between different health centres and hospitals and over time and whether different indicators collected present a coherent and consistent picture
- c. **External validity** – refers to the extent to which indicators accurately reflect the reality on the ground.

This remote phase of validation addresses only the first two levels; external validity can only be assessed through triangulation, either with alternative data sources or direct observation in the field. However, potential issues with external validity for further exploration have been documented where they arise.

#### Integrity of monitoring data

- ✓ No significant issues were identified with regard to completeness and accuracy of data at different levels of the M&E system.
- ✓ As far as it was possible to validate, the different datasets that VFAN maintains correspond with one another.

The analysis of the sample of **monthly reports** shows the datasets to be largely complete and free from data entry errors. A small amount of data cleaning was required to assemble the sampled monthly reports into a single database. The most common types of data-cleaning required were

- numbers stored as text

- mis-named health centres.
- Missing total screenings (which could be remedied by totalling Male and Female cases)

Given that transcription from monthly reports to overall performance data is manual rather than automated, the impact of this kind of error is minimal. Overall, the volume of errors is small and has a negligible impact on overall figures. Looking across the full set of monthly reports supplied, a very small number of monthly reports from district hospitals were missing and a small number of individual health centre reports were missing in specific months. This suggests that the government health staff are sufficiently resourced and incentivised to manage the process properly.

**Weekly reports** were supplied as a compiled database which was assessed as a whole. As with monthly reports, the data was found to be highly complete and error free. A small amount of missing data and meta-data was identified, which would have a negligible impact on overall results. It was not possible to directly validate that the data in weekly reports is reproduced accurately in monthly reports, as the latter does not contain information with which to isolate outreach cases. However, we found no weekly reports where the total number of cases (summed over the month) exceeded those in the sampled of monthly reports, which rules out the possibility of major data processing errors.

Transcription of the monthly reports to the **summary performance data** was also found to have a high degree of accuracy. For the May 2016 sample, a 0.5% difference was found between the figures in the overall performance data database, largely accounted for by just one district where health centre records were missing in the monthly reports.

#### Measurement validity and reliability of indicators

Without any external reference point, we must review the validity of the indicators as a set, drawing comparisons between the different indicators themselves, different reporting units (health centres/districts) and – where necessary – over time to examine whether the data present a consistent and coherent picture.

This section presents the key messages arising from analysis of the sample of monthly reports obtained. Annex B provides details of the analysis undertaken and charts.

#### **Aggregation/disaggregation**



Aggregate and disaggregate indicators are highly consistent with one another.

The correspondence of aggregate and disaggregate data suggest care has been taken in compiling and checking of reports:

- in 96 per cent of reports, the total male and female screenings equalled total screenings
- similarly, 96 per cent of reports the sum of all age categories equalled the total.



## Screenings vs. conditions diagnosed

- In a large majority, but not all, reports these indicators are substitutes for one another i.e. total screenings equals the sum of diagnoses. This is not accounted for by the numbers found not to require treatment. It is possible there is inconsistent recording, or the definition of what constitutes a 'screening' or assessment is inconsistently applied in different health centres.

The screenings indicator is intended to measure the total number of clients undergoing primary eye assessments, while the diagnoses indicators are intended to measure the total number of conditions diagnosed. Hence one client may in theory result in more than one diagnosis, or a client may have no diagnosis (in which case they would be recorded as having "no treatment / offered counselling").

However the analysis reveals a very high degree of correspondence between the total number of patients screened and the total number of conditions diagnosed screenings (see Annex B). In 70 per cent of monthly reports reviewed, these figures are exactly equal. This precise correspondence is unexpected, as the total number of screenings should also include those who were not diagnosed with a condition. If we subtract the number of patients without diagnoses from the total screenings, we should have the number of patients diagnosed with any condition. This again shows a strong correspondence: 86 per cent of reports, these figures were exactly equal. The precision of the correspondence between screenings and diagnoses is troubling as they purport to measure different things. It is also surprising that so few screenings result in no diagnosis – i.e. the patient was free from any eye condition. The monthly reports show that on average, in May 2016 only 17 per cent of screenings resulted in no treatment being prescribed.<sup>9</sup>

Two possible explanations are suggested. In both scenarios, the total screenings indicator would understate the actual number of screenings taking place. First, it is possible that many health centres are reporting "no treatment" in addition to, rather than as part of total screenings. Alternatively, it is also possible that screenings which result in no-diagnosis are not being recorded by health staff in many – but not all – health centres. This may be due to the way in which patients are initially triaged (i.e. most eye-related conditions are picked up at triage, which is not recorded). As a result, we recommend further work to explore and document how screenings are undertaken and recorded in health centres.

## Diagnoses vs. treatments

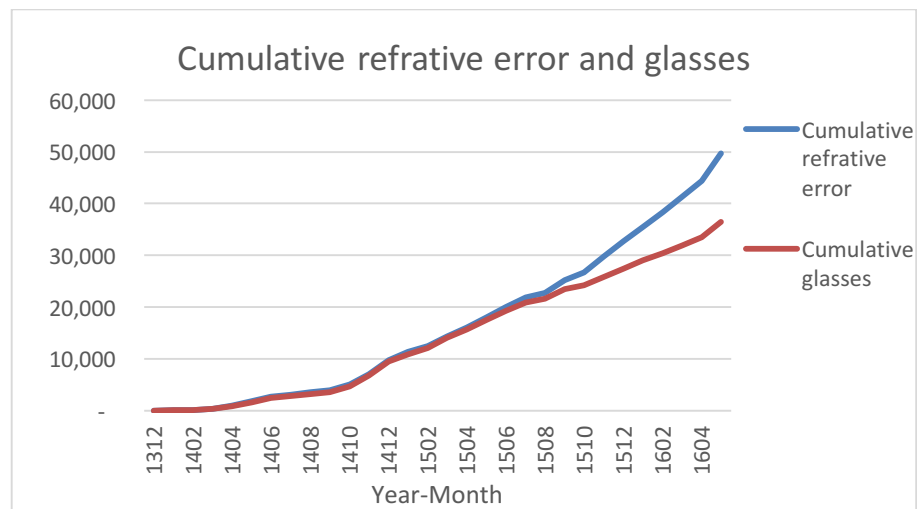
- ✓ As expected, there is a strong correspondence between diagnoses and treatments for conjunctivitis and refractive error.
- While not an M&E issue, it may be useful to explore further the reasons for the lower treatment rate for refractive errors under the outreach programme

Correspondence between conjunctivitis and eye-drops prescribed is highly consistent across the sample. In the two cross sections of data analysed, 60 per cent of health centres reported an equal number of refractive error diagnoses and prescriptions for

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<sup>9</sup> 'No treatment' indicator is only available for the sampled reports from May 2016.

glasses. There appeared to be a greater correspondence between these two variables in the earlier sample.<sup>10</sup> This is corroborated by the larger (but incomplete) time-series which shows a gap emerging starting in mid-2015:



Analysis of the outreach weekly reports data show that this gap is largely explained by the low take-up of glasses relative to diagnosis in the outreach programme. On average less than 4 in 10 of those with refractive errors purchase glasses during outreach screenings.

**Referrals sent vs. referrals received.** In the two cross sections of data analysed, 52 per cent of health centres reported an equal number of referrals sent and received. 90 per cent of the remainder referrals received were fewer than referrals sent. This is as expected, so does not raise any immediate concerns with regard to referral data.

**Stability of reports over time.** At the district level, a sample of districts was used where reports spanning the period March 2014 to May 2016 were available. Descriptive time-series analysis shows that, as we would expect, stability of indicators is proportional to the number of cases on which they are based. So while total screenings is largely stable or increasing secularly, volumes of referrals are less stable from month to month.

#### External validity

While the fitness for purpose, integrity and internal validity of the data have been reviewed, the external validity of VFAN's monitoring data has not been possible to verify in this remote phase due to limited access to external data that might support triangulation. This means we cannot be certain that the data are an accurate reflection of reality on the ground. However, the analysis of data does not point to any specific concerns with external validity, except for the issue of screenings vs. diagnoses noted above.

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<sup>10</sup> Pearson r2 of 0.55 in Sept 2015, and 0.31 in May 2016

## 5 Conclusions and recommendations

VFAN collect a relatively narrow range of quantitative input and output monitoring data at a high frequency. This has clearly supported the operational needs of rapidly rolling out their primary eye-care programme across the country. Questions of longer-term impact are dealt with via discrete research/evaluation exercises. As the programme matures, it may be useful to consider developing regular measures of programme quality.

In spite of limited access to the MoH's own HMIS reporting system, VFAN enjoys close cooperation with the ministry in operationalising an efficient standalone data collection system (notwithstanding a hiatus at the time of writing due to the departure of the health minister) that provides timely data from over 500 health centres. That this is functioning well with few difficulties is notable and appears to reflect both the relative modernity of the Rwanda health system and support at a high level for VFAN's programme. These factors should be borne in mind if VFAN considers replication of the approach in other contexts.

Overall, the data that VFAN collect appears of good quality in terms of data integrity and internal consistency. This review has not been able to properly assess the external validity of the data, however, with one exception, no indications of issues were found. The exception is the unexpected correspondence for many – but not all – health centre reports between the indicators of screenings and diagnoses. One issue of significance was identified with the indicator set that VFAN collects: the degree of correspondence observed between the total screenings and total diagnoses indicators does not appear to reflect how these have been defined by VFAN. We therefore recommend further investigation into the recording of screenings that result in no diagnosis via field verification. This could be done alongside a light touch field verification of VFAN's monitoring data that would confirm the external validity of the indicator set.

### **Recommendations for further field verification**

The purpose of a field verification exercise would be to externally validate the data contained in VFAN's monthly reports. Field verification would include:

- Observation of health centre and outreach programme screenings vis-a vis health centre's paper records.
- Comparison of paper records held at health centres vis-à-vis monthly and weekly reports submitted to VFAN

We would suggest a relatively small (5-10), purposive sample of health centres to include:

- Outreach health centre where 'no treatment' indicator is consistently zero
- Outreach health centre where some 'no treatment' cases are reported, but where diagnosis indicators are consistent 1:1 with screenings
- Health centres where total screenings minus 'no treatment' approximately equal diagnoses (as we might expect).

## Annex A: Indicators collected via VFAN's monitoring system

#	Variable name	Definition	2016	2015
1	Reporting_month	(Meta-data) The reporting month	✓	✓
2	Hospital	(Meta-data) Name of the Hospital	✓	✓
3	Health_Center	(Meta-data) Name of the Health Center	✓	✓
4	Total	Total number of patients who had their eyes checked in the reporting month	✓	✓
5	M	Number of male patients assessed in the reporting month	✓	✓
6	F	Number of female patients assessed in the reporting month	✓	✓
7	0-14_yr	Number of patients assessed aged from 0 to 14 years old in the reporting month	✓	✓
8	15-39_yr	Number of patients assessed aged from 15 to 39 years old in the reporting month	✓	(a)
9	40+	Number of patients assessed aged 40 years and above in the reporting month	✓	
10	Allergic conjunctivitis	Number of patients with red eyes, itching eyes and normal vision (can see 6/12) in the reporting month	✓	(b)
11	Bacterial conjunctivitis	Number of patients with red eyes with discharge and normal vision (can see 6/12) in the reporting month	✓	
12	Refractive error	Number of patients with abnormal vision which is corrected by glasses in the reporting month	✓	✓
13	Others	Number of patients with other eye conditions which are not mentioned above in the reporting month	✓	✓
14	Reading glasses + 1.50	Number of glasses of + 1.50 power which were dispensed in the reporting month	✓	(c)
15	Reading glasses + 2.00	Number of glasses of + 2.00 power which were dispensed in the reporting month	✓	
16	Reading glasses + 2.50	Number of glasses of + 2.50 power which were dispensed in the reporting month	✓	
17	Reading glasses + 3.00	Number of glasses of + 3.00 power which were dispensed in the reporting month	✓	

<b>18</b>	Adjustable	Number of adjustable glasses dispensed in the reporting month	✓	✓
<b>19</b>	Cromosol	Number of vials of cromosol dispensed in the reporting month	✓	✓
<b>20</b>	Antibiotics (Tetra, CAF, Genta) and other medication	Number of Antibiotics (Tetracycline, chloramphenicol, Gentamycin) and other medication dispensed in the reporting month	✓	✗
<b>21</b>	Other medication	Number of Other medicine dispensed which are not mentioned above in the reporting month	✓	✗
<b>22</b>	No treatment (Counselling)	Number of patients who were given no medicine (Counselling) in the reporting month	✓	✗
<b>23</b>	Referrals	Number of patients who were referred to the secondary level for further treatment in the reporting month	✓	✓
<b>24</b>	Referrals received	Number of patients referred by Health Centres who were received by District Hospitals	✓	✓
<b>25</b>	Reading glasses in stock	Number of Reading glasses in the Health Centre pharmacy stock in the reporting month	✓	(d)
<b>26</b>	Adjustable glasses in stock	Number of adjustable glasses in the Health Centre pharmacy stock in the reporting month	✓	(d)

(a) Prior to October 2015, age categories were defined as: 0-14, 15-49 and 50+

(b) Prior to October 2015, only allergic and bacterial conjunctivitis were grouped together

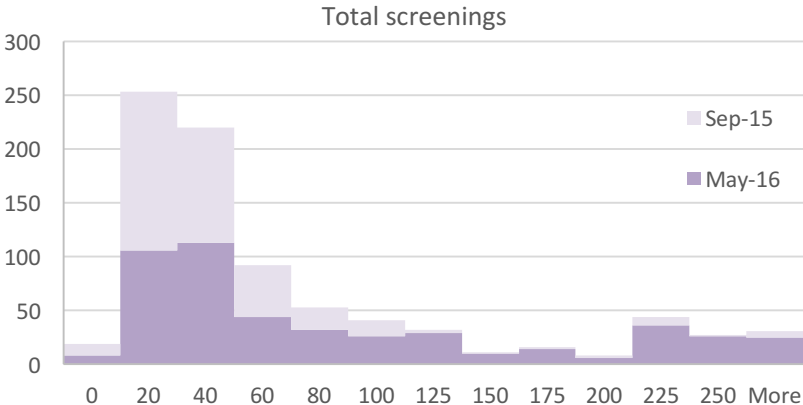
(c) Prior to October 2015, the power of reading glasses was not recorded.

(d) Some health centres record this (Yes / No) as stipulated, while others give the exact number in stock.

# Annex B: Analysis of key indicators

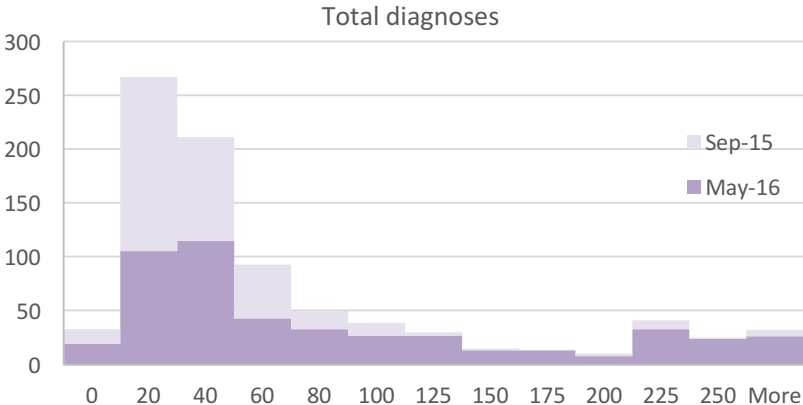
## Distribution of key indicators

**Total screenings** (sample of HC level monthly reports, May 2016 and September 2015)



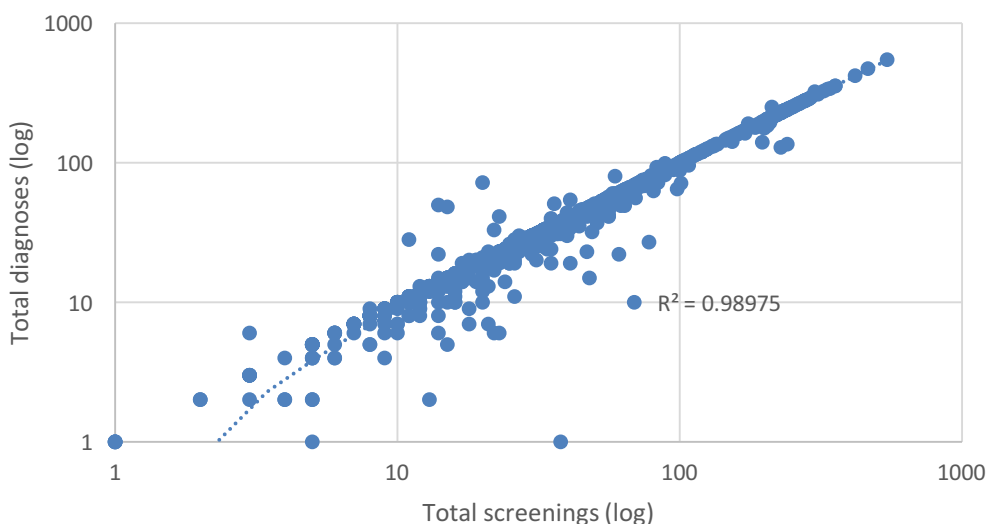
The mean of total screenings in monthly reports is 66, while the median is 32. The vast majority of monthly reports exceeding 200 people screened are from the 2016 sample, reflecting the growth of the outreach programme in participating HCs.

### Total number of conditions diagnosed



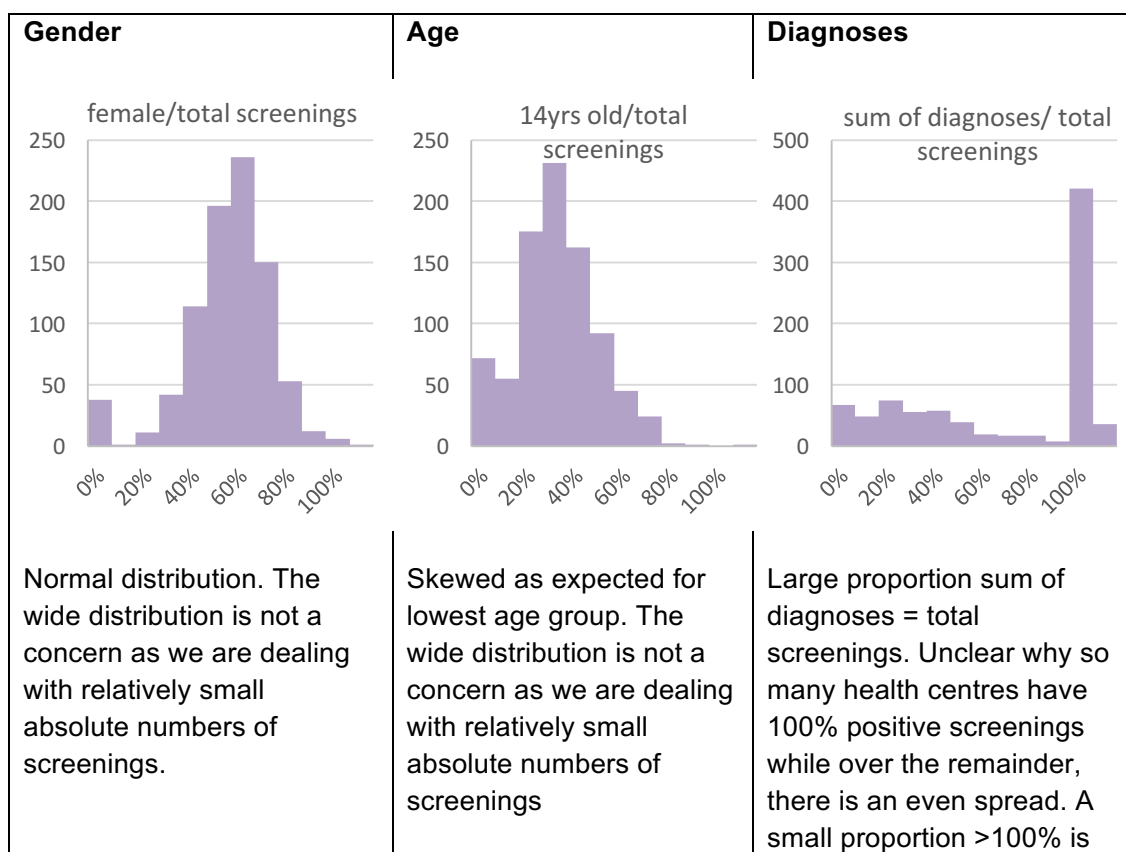
The number of conditions diagnosed shows very similar profile to total screenings, with a mean of 64 and a median of 30. The correspondence between total screenings and number of conditions diagnosed is striking when plotted against one another. This is somewhat surprising and raises questions about the definition or recording of 'screenings'. In 70 per cent of health centre reports, the two indicators are exactly equal.

Figure x: Total screenings vs. Conditions diagnosed



As % total screenings

The remaining indicators we have analysed as ratios with total screenings, or with other indicators. This is because analysing the distribution relative to total screenings provides more useful information than simply the volume of prescriptions etc. The charts show below show key indicators as a % of total screenings, at health centre-level for the cross section (May 2016 and September 2015).



		because indicators count different things (
<p><b>No treatment (2016 only)</b></p> <p>no treatment/total screenings</p>	<p><b>Glasses (all)</b></p> <p>glasses/total screenings</p>	<p><b>Drops (all)</b></p> <p>drops/total screenings</p>
<p>Large proportion at 0%, remainder is skewed. Again, unclear why positive diagnosis rate is so high (and exactly equal to total)</p>	<p>Skewed normal, as expected.</p>	<p>Bimodal – significant no. at 0% (perhaps no stock?), then normal. Small no &gt;100% is due to erroneous recording of totals, so not a concern.</p>
<p><b>Glasses / refractive error</b></p> <p>glasses/refractive error</p>	<p><b>Drops / conjunctivitis</b></p> <p>drops/conjunctivitis</p>	<p><b>Outward Referrals</b></p> <p>outward referrals/total screenings</p>
<p>As expected: in almost all health centres, 100% of patients diagnosed with refractive error prescribed glasses.</p>	<p>Bimodal – large proportion at 100% as expected. Significant proportion at 0% - possibly due to no stock?</p>	<p>Referrals &gt; 100% screenings is due to referrals being recorded against hospitals rather than HC's themselves. This is not a concern when results are aggregated</p>



