TT Tracker

TT Tracker Overview

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What, Why, and How

Purpose

The international trachoma community has committed to eliminate trachoma as a public health problem, which includes reducing the level of TT to <1 case per 1000 population by providing surgery to those who need it. It is the shared responsibility of the international community, surgeons, supervisors, Ministries of Health, partners, donors, and the World Health Organization (WHO) to ensure that we address the quality of service to patients while working toward trachoma elimination. In response to this need, the WHO advocated for the

Photo: Peter Caton

development of a common application that could be used across country programs. The TT Tracker does this, addressing challenges related to TT surgery provision; it ensures that patients requiring follow-up are known to the program, that surgeon performance is tracked so that any additional training needs are recognized, and that reporting is timely, allowing programs to both assess the success of past outreach and plan for future outreach.

The Basics

The TT Tracker was developed using the CommCare platform, which is mobile data collection software that has already been successfully used by community health workers in over 50 countries worldwide and is designed for low-resource environments. Using CommCare, programs are able to track patients longitudinally through surgical intervention and follow-up, entering data on GPS-enabled Android phones or tablets.

In a nutshell, patient data is collected at five points:
1. Registration and evaluation: Demographics, TT diagnoses, recommended intervention
2. Surgery: Type of operation/sutures, surgeon performing surgery, related complications
3. Post-surgical follow-up on day one: Surgical outcome assessment and actions taken to address complications
4. Post-surgical follow-up at 7-14 days: Surgical outcome assessment and actions required to address complications
5. Post-surgical follow-up at 3-6 months: Surgical outcome assessment and actions required to address complications
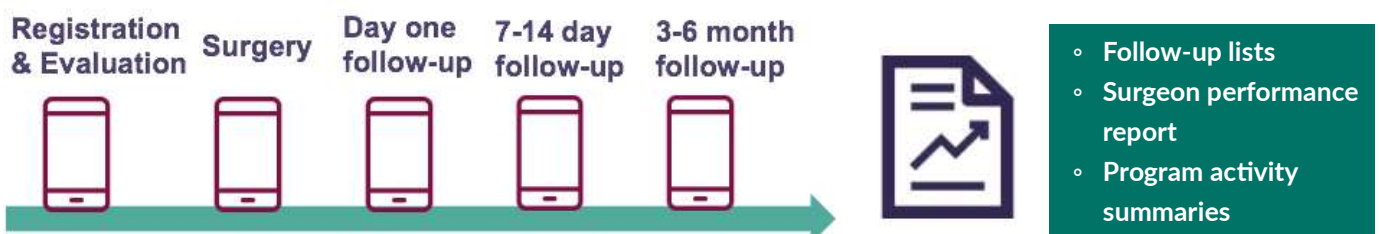
Reports are then created based off of the information collected:

- A web portal for designated individuals gives access to up-to-date information on all program activities
- Automated reports can also be sent by email to designated people at each level (national, regional, district) of the program, as follows:
  ○ Lists detailing patients who are due for 7-14 day and 3-6 month follow-ups
  ○ Performance reports to assess surgical outcomes by each individual TT surgeon
  ○ Summary reports with TT patient demographics, number of patients and eyes operated, follow-up completeness, and surgical outcomes
- Individual surgeons receive a personalized report meant to encourage their engagement and investment in the program, including the number of surgeries completed nationally and their individual surgical outputs and outcomes

Is the TT Tracker Right for Your Program?

As said above, the TT Tracker can help programs better document surgical outputs to track progress toward the trichiasis elimination goal, support improved follow-up rates, and assist in ensuring that surgeons are sufficiently trained and providing the highest quality care to surgical patients. The TT Patient Tracker is suitable for programs that:

- Are conducting trichiasis surgeries in a GET2020 Alliance country
- Struggle to achieve completion of some or all of the targeted post-operative follow-up visits for TT surgical patients, specifically those beyond the 24-hour follow-up
- Require laborious reviews of patient records to develop patient follow-up lists
- Face challenges with maintaining up-to-date or accurate records
- Experience burdensome data collation activities when program reports are due
- Wait long periods of time to receive program reports to understand what is happening in the field
- Lack the ability (beyond surgical audits) to assess surgical outcomes by individual surgeon and desire a more regular assessment of surgical outcomes to determine further training needs.
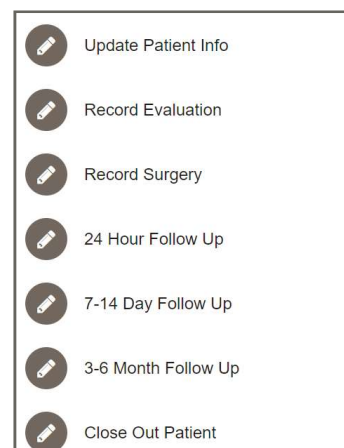
The TT Tracker Development Team can support you in determining whether the TT Tracker is a suitable option for your program, and share additional information on budgetary and implementation considerations.

Photos: Peter Nicholls (left); Javier Acebal (center & right)

Data Collection

The TT Tracker is a form-based system, with various electronic forms incorporated into the phone application. The forms simulate the ICTC-based paper forms used for surgical outreach and have been created to address registration, evaluation, surgery, and follow-ups. Though the ICTC forms are standardized for use across countries, there are often slight differences between a program's paper copy and the TT Tracker form. A country program can therefore make slight modifications to their forms (e.g. suppressing questions or adding questions).

Update Patient Info

Record Evaluation

Record Surgery

24 Hour Follow Up

7-14 Day Follow Up

3-6 Month Follow Up

Close Out Patient

Patient Surgical Registration

Patient registration information including demographic and residence information is collected. When a patient intervention is registered, he/she is also assigned to the designated Session (or Site) for the given outreach. They are given a unique patient ID which will be used to associate future entries for the patient. *See supporting documentation for specific survey questions.*

Patient Surgical Evaluation

The screener records all of the evaluation information for the eyes suspected of TT (eyes not suspected of TT will be recorded as not suspected, allowing the user to skip the questions that will not influence the imminent intervention). The recommended action is documented for the eyes requiring intervention (surgery, epilation, referral) as well as those who refuse treatment. *See supporting documentation for specific survey questions.*

Patient Surgery Record

For patients who require intervention, a surgical form will be completed by the surgeon or surgical assistant after the surgical intervention has been conducted. Programs may choose to complete the Surgery Form for epilation only patients if follow-up with epilation patients is desired. *See supporting documentation for specific survey questions.*

Photos: Javier Acebal (left); Peter Caton (center); Graeme Robertson (right)

Patient Follow-up Records

Surgeons access the patient surgery file via the due Follow-Up Lists on their phone or by searching the patient list by the Patient ID or name. They then select the follow-up form to be completed (24-Hour, 7-14 day or 3-6 month). If all phones have been synced, the full surgical/intervention record will be available so that surgeons are equipped with all necessary information to complete the follow-up visit. This will allow a surgeon to attend to a patient even if he/she did not provide surgery to the patient. Once completed, the patient will be removed from the list until the subsequent follow-up time period. *See supporting documentation for specific survey questions.*

Standard follow-up windows have been extended in the application to accommodate for those who may be delayed in attending a follow-up session. The window for each of the follow-ups are:

- 24-hour follow-up: 1-3 days
- 7-14 day follow-up: 6-21 days
- 3-6 month follow-up: 3-7 months

Reporting

There are several types of reports available and ways to access those reports. Below we share the options for country programs.

Reporting Tools

Data Visualization and Analysis: Metabase

Metabase is a data visualization tool that can be utilized by programs for easy data analysis and graphics development. The tool only accesses de-identified summary data exported from the TT Tracker system to provide programs with a daily-updated snapshots and reports of activities conducted in program areas. Reports are customizable; a set of reports will be created by the TT Tracker Development Team and saved to the country project for ease of use.
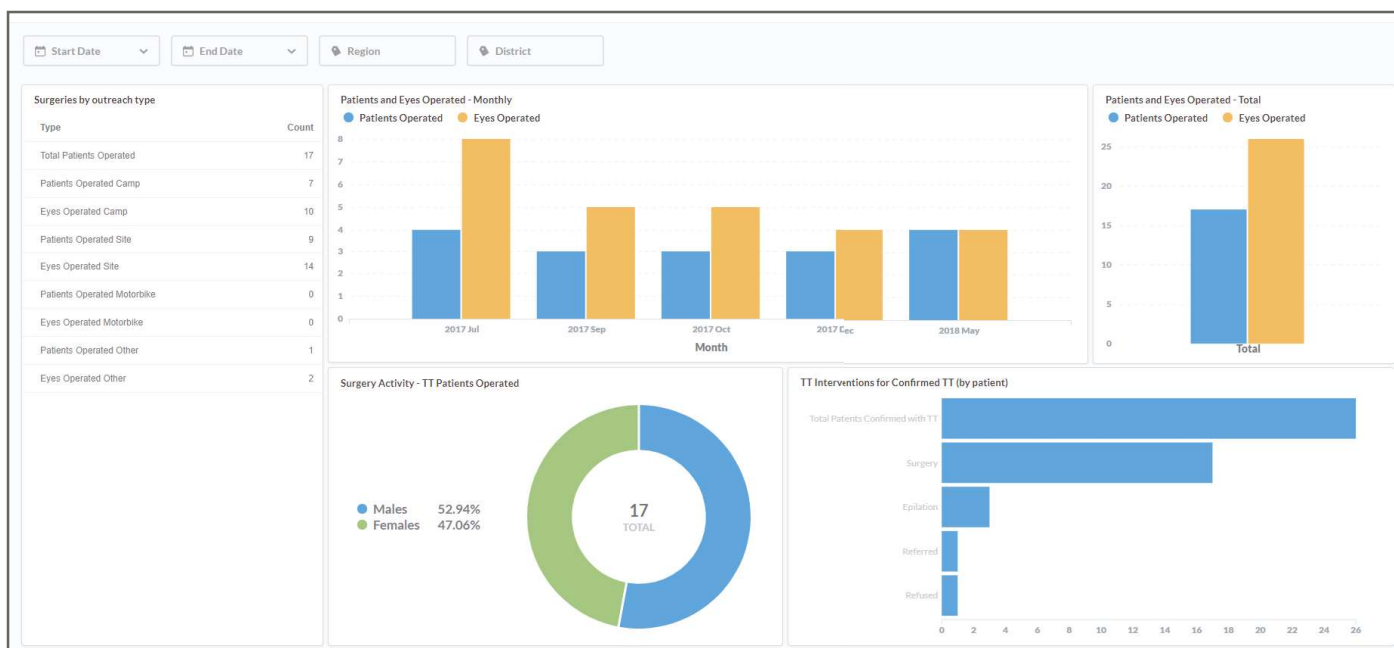
Metabase is username and password protected so that no unauthorized users have access to the aggregate information. Ministries will have access to the complete national-level data with the ability to review data at the smaller regional or district level. All other partners will be granted access to the appropriate level of data—no supporting partner will have access to other partner data. *See supporting documentation for specific data security information.*

Metabase provides easy to use, up-to date, searchable reporting capabilities not available with the other report options, and is therefore suggested for use by every program.

Automated Reports: Emails

Automated emailed reports can be sent directly to specified individuals, if requested. This reporting system will be used by programs either in conjunction with Metabase or instead of it. Program supervisors at various levels can receive:

- Summary reports with TT patient demographics, number of patients and eyes operated, follow-up completeness, and surgical outcomes
- Lists detailing patients who are due for 7-14 day and 3-6 month follow-ups
- Performance reports to assess surgical outcomes by each individual TT surgeon

Though no graphs, charts, or tables can be sent, it still offers the ease of receiving regular reports automatically, in an Excel format. This option must be requested and approved by programs as it sends patient data to select individuals outside of the CommCare system.

Sensitive Reports and Exports: CommCare Report Builder

The internal reporting system of CommCare allows users to access the patient records stored in the system via saved exports and/or the report builder.

> **Exports**: Each country program will be provided with a set of pre-determined exports that can be used. One example of an export is patient records exported in a line-list format within Excel, which can be used for planning or documentation in static health facilities.

> **Report Builder**: Each country project can save five reports to the country program; programs can adjust these reports depending on the determined need of the project. The report builder allows programs to produce exports required for program activities with minimal effort in adjusting formatting, as is required for Exports.

The CommCare report builder does not have the data analytics and visualization capabilities that Metabase does, though does give access to and maintain the security of the identifiable patient data. Once the exports are downloaded, it is the responsibility of the program to maintain the records in a secure location and follow necessary procedures to ensure unauthorized data access is limited.

Reports List

Summary Activity Reports: Available via email, CommCare, and (de-identified) on Metabase

Monthly summaries provide programs with a snapshot of the activities and outcomes that have taken place over the previous month and year-to-date (if receiving the report via the CommCare Emailer) or month, year-to-date, or other designated time period (if utilizing the Metabase online interface). Automated summary reports sent via the CommCare emailer or Metabase will be sent monthly, unless otherwise specified by the program. Administrators can easily select additional queries to be sent from Metabase to designated individuals on a daily, weekly, or monthly basis using the "pulse" feature, which can be started or stopped at any time. If programs use Metabase for reporting activities, the Activity Summary is available on-demand by accessing the Metabase website using the assigned username and password.

Activity Report - District

District	Total Screened	Male Screened	Female Screened	TT Total	TT Male	TT Female	TT Under15	Surgery Male	Surgery Female	Epilation Male	Epilation Female
Beta One	120	60	60	1	1	0	0	3	0	0	0
Beta Two	-	-	-	0	0	0	0	1	0	0	0
Alpha One	12	6	6	15	8	7	1	6	4	0	2
Alpha Three	-	-	-	1	0	1	0	0	0	0	0
Alpha Two	14	4	10	0	0	0	0	1	1	0	0
Beta One	232	100	132	5	3	2	0	1	2	0	0

Above is a simulation of the report that can be obtained using Metabase. Program activity information will be summarized automatically and can be downloaded into Excel for further analysis, if desired.

Patients Due for Follow-up: Available via email or CommCare

In addition to the 'patients due for follow-up' lists available through the phone of the TT Tracker, an automated report shows patients due for 7-14 day or 3-6 month follow-up in a given area. If emailed, the list is attached in Excel so that users can download and manipulate the file as needed.

Patients Due for 3 - 6 Month Follow Up

Overdue?	Name	Age	Sex	Patient District	Patient Village	Phone	Owner of Phone	Surgery Date	Session Name	Session ID	Surgeon Name
	Elizabeth Sana	30	female	Alpha One	Mina	4448898	Family Member	2017-12-01	Alpha Health Post	AA-TT-3	Miriam Tana
	Ariet Guell	23	female	Alpha One	Pukedi			2017-12-01	Alpha Health Post	AA-TT-3	Miriam Tana
	Michael Fisseha	90	male	Alpha Two	Terkudi	2545652	Patient	2017-10-13	Terkudi Primary School	AA-TT-2	Naomi Maouro
	Tigist Omod	90	female	Alpha Two	Terkudi	4447877	Family Member	2017-10-13	Terkudi Primary School	AA-TT-2	Naomi Maouro
Y	Mary Abwolla	58	female	Alpha Two	Gambella			2017-07-21	Gambella Health Post	AA-CR-5	Jonathan Iga
Y	Joseph Obang	65	male	Alpha Two	Ajingi			2017-07-02	Ajingi Primary School	AA-CR-4	Abraham Shafi

Above is a simulation of the report supervisors can receive via email. The reports will show what patients are due and overdue for 7-14 day or 3-6 month follow-up in a give area. Report will include all relevant information that may be used to organize outreach activities to conduct follow-up.

Surgical Outcomes and Performance Assessments: Available via email or Metabase

The surgical outcome assessment includes monthly and year-to-date totals for surgeries completed by each surgeon, as well as the year-to-date totals for follow-ups completed and the outcomes of those follow-ups by surgeon. The report is available using via email and is also accessible using the Report Builder within CommCare, though the Administrator will be required to complete the request individually when using the Report Builder and reports will not be automated.

Surgical Outcomes (by Surgeon)

Surgeon ID	Regions where Active	Districts where Active	Patients Operated	Eyes Operated	24H Follow-Up (Eyes)	24H Complication (Eyes)	24H Overcorrection (Eyes)	24H Undercorrection (Eyes)
5	Beta	Alpha Two, Beta One	0	0	0	0	0	0
7	Beta	Beta One, Beta Three	1	1	0	0	0	0
10	Bcta	Bcta Onc	1	2	0	0	0	0
Unknown	Beta	Alpha One, Alpha Two, Beta One, Beta Two	0	0	0	0	0	0

Image shows the de-identified surgeon performance report available on Metabase, using the surgeon ID rather than surgeon name. The report, which can be sent automatically to designated surgeons with surgeon names identified, demonstrates areas where surgeons were active, the total number of patients and eyes operated, and the surgical outcomes at various follow-ups.

A summary report available through Metabase also provides the outcome assessment for programs, summarized by district. This will allow programs to see how surgical provision outcomes vary across districts.

districts	patients_operated	eyes_operated	24H Eyes w/ Follow Up	24H Eyes Complication	24H Eyes Overcorrection	24H Eyes Undercorrection	24H Eyes Cont. Abnorm.	7-14 Day Eyes Follow Up	7-14 Day Eyes Complication	7-14 Day Eyes Overcorrection	7-14 Day Eyes Granuloma	7-14 Day Eyes Cont. Abnorm.
Alpha One	2	2	1	0	0	0	0	0	0	0	0	0
Alpha Two, Beta One	1	1	0	0	0	0	0	0	1	0	1	0
Alpha One	3	3	3	2	0	1	0	1	1	0	1	0
Beta One	0	0	0	0	0	0	0	0	0	0	0	0
Alpha One	3	3	1	1	1	0	1	0	0	0	0	0
Beta One	1	2	0	0	0	0	0	0	0	0	0	0
Alpha One, Alpha Two, Beta One, Beta Two	0	0	0	0	0	0	0	0	0	0	0	0

Image shows only a section of the surgeon performance report. Surgeon IDs are not visible but do appear in actual report. Report can be viewed via Metabase using unique surgeon IDs or received via email with identifiable surgeon names included. Areas where each surgeon is active along with is/her productivity and surgical outcomes appear in the report.

Individual Surgeon Report: Available via email

M Gmail

Surgeon Report for October 2017
10 messages

TT Patient Tracker   Mon, Nov 6, 2017 at 9:52 AM
To:

Dr Yeugh
October 2017

Your contribution to trachoma elimination

This is what's been done nationally

2 surgeries completed this month   **9** surgeries completed this year
3 7-14 day follow-ups completed this year   **33%** positive outcomes of completed 7-14 day follow-ups
0 3-6 month follow-ups completed this year **N/A %** positive outcomes of completed 3-6 month follow-ups

Your individual report

0 surgeries this month
1 surgeries this year
0 7-14 day follow-ups done on your surgeries this year   **0** 3-6 month follow-ups done on your surgeries this year

Outcome of those 7-14 day follow-ups: *Outcome of those 3-6 month follow-ups:*

N/A % Success rate   **N/A %** Over-correction   **N/A %** Success rate   **N/A %** Over-correction
                         N/A % Granuloma   **N/A %** Granuloma
                         N/A % Contour-abnormality   **N/A %** Contour-abnormality

See any areas you'd like to improve upon? Please contact your supervisor.

Thank you for your continued dedication to helping your community.
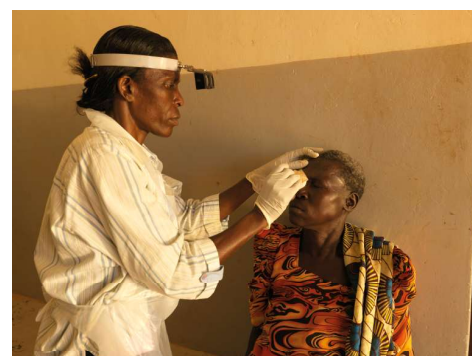Keep up the good work!

Photo: Peter Caton

Photo: Graeme Robertson

The surgeon report encourages surgeons supporting the TT program by sharing their contribution to the global elimination efforts. The report will be sent to surgeons who conducted at least one surgery in the previous month and who have email addresses.

> ## Selecting a Reports Package
> Countries will determine what reporting is desired for the program. During the introductory consultancy, the TT Tracker Development Team will discuss the preferred reporting method(s) to help reach a decision. *See supporting documentation for reports catalogue.*

System Configuration

Setup and Management of the TT Tracker

The TT Tracker was developed to limit ongoing system maintenance for countries, though some local upkeep is required. An Administrator should be designated within the Ministry or a coordinating partner office. Simple data management and system updates, such as maintaining up-to-date surgeon lists, project areas, and program supervisors will be necessary. Any data errors not addressed in the field should be reported by field staff and fixed by the designated Administrator. The Administrator will review submitted data and contact implementing partners if any data are flagged due to inconsistencies. All users needing access to the TT Tracker system (both mobile and web) must also be entered and kept up to date.

The TT Tracker Development Team will create the TT Tracker for a country in collaboration with the country program. Users will be created, roles assigned, and access determined. As the project is implemented, the the TT Tracker Development Team will continue to provide the Administrator(s) support as needed.

System Modifications

Programs can make slight modifications to the country survey, though this must be agreed upon with the country program at the onset of implementation and in collaboration with coordinating partners and the TT Tracker Development Team. The TT Tracker should generally be a tool used universally across country programs so costs can remain low, thus significant changes to country-specific projects will be limited. If a program makes changes to the structure of a country survey without the support of the TT Tracker Development Team, the TT Tracker Development Team cannot guarantee application stability.
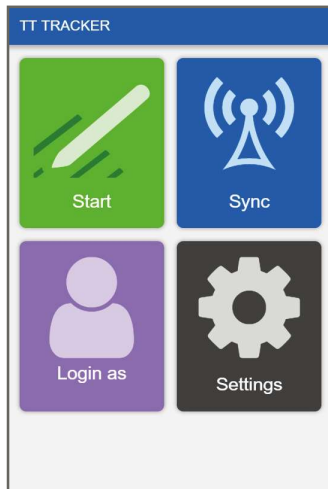
Data Access and Security

Coverage Areas

The TT Tracker limits access to patient records to those in a designated coverage area, which can be defined as district, region, zone, country, etc – generally the area in which outreach teams share surgery and follow-up responsibilities. Patient information will therefore only be visible to individuals in those areas who may need access to it for conducting and documenting surgery, follow-up, or surgical audits. It will therefore not matter who enters the original patient information or conducts the surgery; all individuals providing TT surgical activities can assess surgical outcomes for a patient and record them.

Syncing

Patient data is stored within CommCare and made accessible to all surgeons/recorders in given coverage areas. In order for this to occur phones must be synced, which is done when there is an existing network connection. When a mobile user syncs the TT Tracker all new records are uploaded and made accessible to others working in the given coverage area. Concurrently any newly-uploaded records submitted by other users within the coverage area will be downloaded to the phone. Note that phones can store patient records that have not yet been synced on the phone until the phone is in a location with a network connection.

Standard syncing practices are needed to ensure that phones and users have the most up-to-date information prior to commencing the outreach activity. It is encouraged that programs establish a plan for syncing all phones at the end of the day of outreach (if possible) as well as before beginning the second day of outreach.

Where There is No Network

As said above, phones need to be synced so patient records can be shared between phones in a coverage area. In the settings without any access to a network connection the information entered is stored on the physical phone until the synchronization process can take place. Those patients' surgical information will thus be visible and modifiable on the phone on which the information was entered but will not be accessible on other phones within the coverage area until all phones have been synced. During the surgical outreach, multiple forms are completed (registration, evaluation, and surgery); each form may be completed by a different staff member involved in the surgical provision process, though all forms must be completed on the same phone if synchronization is not possible. Programs can easily address this by assigning each phone a number and documenting the number of the phone used on the patient diagnostic form that moves with the patient through the various stations at the outreach camp.

Photos: Kim Jensen
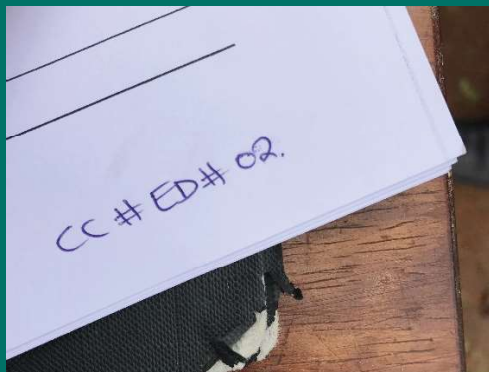
When phones are numbered, Mobile Workers can document when a patient has been registered, using a code to denote who entered the information and on which phone. The subsequent Mobile Worker completing the surgery form will then know on which phone the surgery form should be entered.

Patient Records Storage

Patient records are stored on the Android-enabled phones within the coverage area and are username and password protected; only users working in the coverage area and provided with the username and password will be able to access to the patient records. The records will be synced with the cloud-based CommCare system where they will be stored on HIPAA-compliant servers and encrypted while in transit. *See supporting documentation for data security information.*

Data Ownership and Access

Ministries have access to all data; other partners can be granted access to data in the areas where they are supporting TT surgical activities. The TT Tracker Administrator will assign and limit access to each user. The TT Tracker Development Team and program partners can assist in managing the coordination within and/or across programs to address issues related to the app, data collection, and reports.

All data are owned by the country program. This is established in the Memorandum of Understanding.

Preparing for TT Tracker Use

Training and Support

The TT Tracker Team is available to get countries started and to train teams, which will include a Training of Trainers (ToT) for the designated Ministry officials and program partners, Administrator training, and implementation training for individual surgeons and assistants expected to participate in the surgical outreach. This initial training usually lasts around 10 days. This training is necessary given the complexities of the system.   In-country partners must cover all training costs. Electronic versions of relevant training materials will be provided to programs so that future trainings can be conducted. Sightsavers has covered, and will continue to cover, the cost of software development and platform hosting required to maintain the TT Tracker application.

Phone Purchasing and Ownership

Programs should procure Android-based phones that have been purchased within the last 3-4 years, maximum. Newer phones are preferred for their larger storage capabilities and overall quality. Programs can work with the TT Tracker Development Team to determine how many phones are required, which will depend on the number of simultaneous outreach activities that take place and the number of static sites where TT surgeries are provided. Programs can then determine where the phones are stored and who takes responsibility of the phones. One such strategy for phone oversight is to designate phones to the district level with responsibility assigned to the implementing partner to manage their distribution, maintenance, and use. Costs will include credit so that records can be synced; however due to the low file size of the patient records the cost for maintaining those SIM cards should be minimal.

'Historical' Data Entry

If a program desires to start using the full capabilities of the TT Tracker from the first day of implementation, it will be necessary to enter past TT patient surgical data into the Tracker. Patients who have not yet passed the window for the 3-6 month follow-up (including those that have not yet passed the timeframe for 1-2 week follow-up) can be manually entered into the Tracker using the phone or web app. Programs must locate the hard copies of the patient information and contract an individual(s) to enter the surgical information prior to commencing the use of the Tracker. It is estimated that an individual can enter an estimated 100 patient records per day, depending on the number of eyes that are suspected of TT and how many follow-ups have been completed to date.

Additional Considerations

Action Oriented Application

The TT Tracker is an action-oriented application created to help programs with the existing need of following up patients and tracking surgical outcomes. The application is not intended to act as a program's database, though the TT Tracker can be linked with existing databases so that patient records and surgical information can be accessed, maintained, and used by country programs as they see fit. Further, the Tracker should not be considered as the electronic medical records system for a program, though relevant patient surgery information can be exported for review.

Since the focus of the TT Tracker is to improve surgical provision and follow-up, once a patient has moved through the system and received (or has surpassed the time window for) the necessary follow-ups, the patient case will be closed. The patient will thus not be visible on the phone, though the patient record will still be available within the system and appear in relevant summary reports and exports. If all patient records remained open and available on the phones indefinitely, syncing the cumulative number of TT patients would cause delays, require larger amounts of data and increase the chance of patient selection error.

Paper vs Phone

The TT Tracker is not intended to eliminate the use of paper entirely, as the format of the surgical camps doesn't allow for it—patients must move through various stations of the outreach camp and need documentation to show the screener or surgeon the information that has been recorded thus far. Programs can create a very simplified form used at patient intake, including basic demographic information and/or screening information, the phone on which the registration and evaluation information was entered and the Patient ID. The contents of the diagnostic form will vary by program depending on the structure of the outreach.

Photo: Kim Jensen

User Buy-in

It takes team time to adapt to new processes. Surgeons and surgical assistants will be unfamiliar with electronic data entry, having used paper for years! With this in mind, it may take slightly longer to enter information at the start of the implementation but once users adapt the time required will be equal to or faster than the time required to record the information on paper. Supervisors at all levels, from the field-level supervisors to the Federal Ministry must be engaged in ensuring that individuals are utilizing the TT Tracker for all surgeries so that it presents an accurate picture of the surgical outputs. Those supervisors must also act on the follow-ups lists and reports provided to them to make the system truly transformative for the program. The benefits of using the TT Tracker, experienced over time by the team, should create a virtuous cycle that prompts all levels of users to continue utilizing the application.