CASE STUDY

# MiracleFeet

## CommCare for Treating Congenital Defects

dimagi miraclefeet Google.org

Image Courtesy: MiracleFeet

# OVERVIEW

With funding from a $1M grant from Google.org, MiracleFeet commissioned Dimagi to create a universal tool to track treatment and program data for clubfoot, a common birth defect routinely treated in wealthy countries but historically overlooked in many low- and middle-income countries (LMICs). The condition is fully treatable, but currently only one in five children globally has access to care—making it a leading cause of physical disability worldwide. In ten years, MiracleFeet has developed systems and partnerships to treat clubfoot in 27 countries, where over 70,000 new cases occur each year. MiracleFeet needed a streamlined data collection tool to support and monitor its growing global network of clinics and providers who are increasing access to this critical treatment.

In late 2019, MiracleFeet completed the global rollout of the Clubfoot Administration System (CAST). The mobile app is transforming MiracleFeet's ability to monitor treatment quality and to strategically plan and scale programs to reach populations that lack access to the proven, low-cost method of care. The tool syncs with Salesforce to render user-friendly dashboards with sophisticated analytics and reporting capabilities. This system amplifies and enhances all stakeholders' focus on treatment precision and quality, from program managers to country partners and clinicians.

Nintey-five percent of MiracleFeet-supported clinics have adopted the application, with CAST now in use in 371 clinics across 29 countries, storing nearly 41,000 patient records that document full treatment progress and outcomes.

# SUMMARY

### LOCATION

29 countries across Africa, Asia, and Latin America

### SECTOR

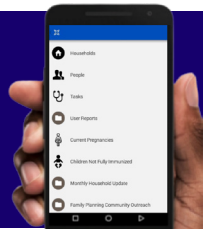
Child Health

### PARTNERS

MiracleFeet, Google.org

### FEATURES

Offline Case Management, Multimedia, Validation Conditions, Case List Filters



### NUMBER OF USERS (TO DATE)

| | | | | | |
|---|---|---|---|---|---|
| 374 | Clinics | 29 | Countries | 273 | Users |
| 4 | Languages | 1,800 | Patient Visits Logged/Week | | |

# PROBLEM

Untreated clubfoot is a leading cause of physical disability, affecting more than two million children worldwide. A readily treatable and common birth defect—with at least 175,000 new cases every year—clubfoot causes one or both feet to turn inwards and upwards and makes walking extremely difficult and painful.

Until the early 2000s, most children born with clubfoot in low- and middle-income countries were not treated due to the complexity of surgery and limited access to safe services. The Ponseti method is a highly effective and inexpensive nonsurgical treatment for clubfoot, which was accepted as the gold standard treatment in the early 2000s, finally making it feasible to tackle clubfoot in low-resource settings. With this approach, 95% of clubfoot cases can be fully corrected without major surgery, resulting in lasting mobility for children born with the condition. Treatment involves a series of casts to gently reposition the feet, followed by a brace worn at night for up to four years to prevent relapse. This noninvasive treatment is ideal for low-resource settings since only basic supplies are needed, and because it costs $500 or less per patient.

In launching a global network of clubfoot treatment clinics, MiracleFeet's main obstacles to efficient data collection and analysis were the low network connectivity of the treatment regions and unreliable methods of patient data collection. The legacy solution was desktop-based, required high bandwidth, and was not optimized for mobile devices. The information collected was well-structured for a research database, but it was not designed to be accessible in diverse settings nor optimized for organizational decision making. MiracleFeet staff could not search or manipulate queries in a useful or timely manner. It was also a cumbersome system for partners or clinic staff to use, without much practical application or value for them. Users without a computer or in a low-connectivity setting found it difficult to consistently use the solution, leading to a high degree of variability in data integrity. MiracleFeet foresaw that without a system for collecting reliable data, scaling treatment to more clinics would become increasingly difficult.

The MiracleFeet team needed a solution to these issues—a tool to collect enough data to be useful, but not so much data that it would prevent partners or clinic staff from consistently using it. It also needed to be a globally relevant system—useable across multiple languages and country contexts.

# SOLUTION

By partnering with Dimagi, MiracleFeet developed the CAST mobile application, an offline-capable and mobile-optimized solution that allows their organization to keep electronic medical records, improve clinic management, and monitor and evaluate the performance of their initiatives around the world.

Prior to the implementation of CAST, organizations working to eliminate the disability caused by untreated clubfoot received diverse mandates from a variety of funding organizations and collected different information in inconsistent formats, which made it hard to track global progress. MiracleFeet uses the application to better understand patient outcomes among different age groups and case types. The application also helps MiracleFeet's partner organizations coordinate teams, organize efforts, and advocate for global treatment.

Nearly all MiracleFeet-supported clinics have adopted the application, with CAST now in use in 261 clinics across 27 countries, storing nearly 30,000 patient records that document full treatment progress and outcomes.

# APP OVERVIEW

CAST is a mobile application that serves three primary functions:

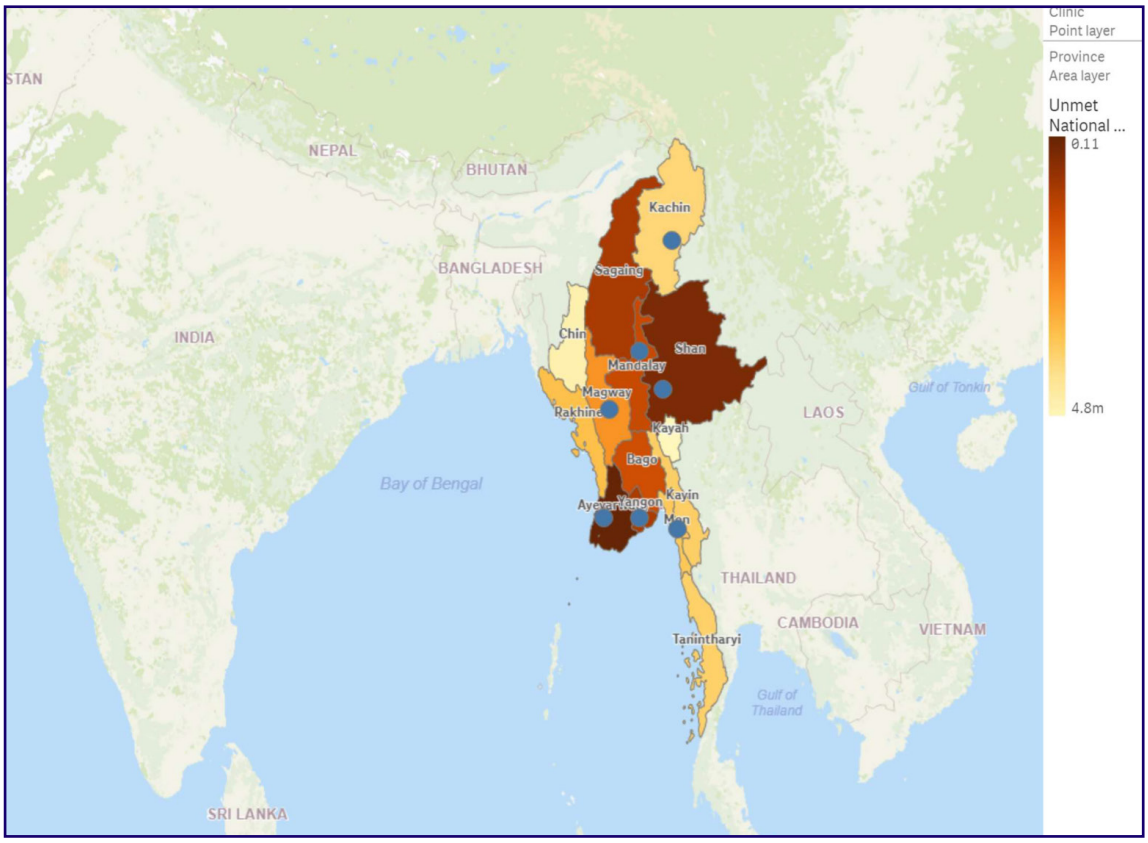
***Electronic medical record***
***Clinic management tool***
***Monitoring and evaluation tool***

CAST contains modules that allow clinic staff to review patient records, register new patients, and record details from patient visits. Users can also easily see which patients are expected in the clinic on a specific day, and which they have already treated.

Additional modules identify which patients have upcoming appointments and which have missed visits, so busy staff can better target their outreach efforts to reduce dropout rates. An SMS feature integrated into the medical record is designed to further improve retention and adherence to treatment by sending patients' families reminders about upcoming and missed appointments, and educational and motivational messages targeted to their phase of treatment. Since CAST is used on a mobile phone, clinic staff can also easily place a call or write a message by tapping on the patient's contact information and using the device's built-in telecom features.

To facilitate ongoing monitoring of treatment quality, data collected in CAST is sent into Salesforce via Open Function. Salesforce reports and dashboards facilitate the aggregation of individual patient and visit records into key performance indicators on treatment quality, which can be used for supportive supervision and to inform programmatic decision making at the clinic, country, and headquarters level. For instance, data collected through CAST have helped MiracleFeet understand:

- ***Where new clinics should be located to meet population needs and reduce travel time and where to train new providers***
- ***The volume of patients these clinics should expect to treat including the number of new cases that should be referred to them***
- ***Where treatment targets are not being met and where providers need refresher training (e.g. if MiracleFeet spots that patients are traveling to another clinic when they already have one in their community, the underperforming clinic is targeted to identify and correct issues of quality and uncover reputational concerns)***
- ***Where patient volume and treatment outcomes are on- or off-target (e.g. if too many older toddlers, rather than newborns, comprise the clinic population, MiracleFeet knows to intervene with midwives and birth attendants on early identification and referral)***
- ***What percent of children born with clubfoot in countries are being treated each year***




Map of the unmet need for clubfoot treatment in Myanmar from CAST data

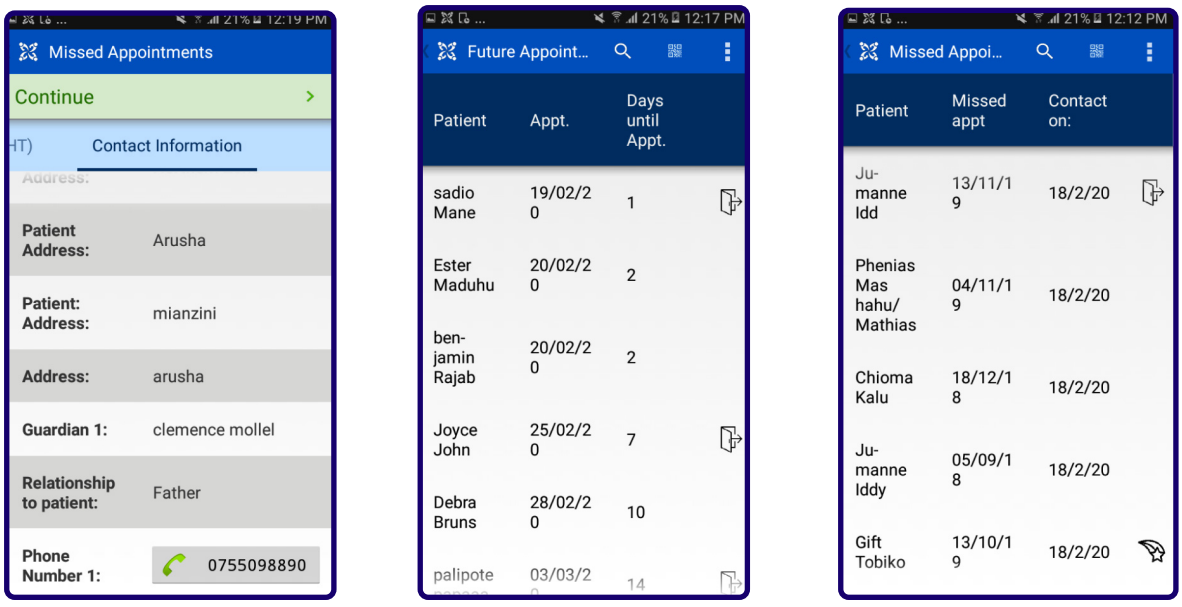
# FEATURE HIGHLIGHT

## Case List for Appointment Tracking

At the end of each appointment form, CAST users record the date of the patient's next scheduled clinic visit. These patients then show up on the "Future Appointments" menu, which allows clinic staff to easily identify and contact them about upcoming visits. Staff can record this contact within CAST and reschedule visits if the patient won't be able to attend their originally-scheduled appointment.

Tailored icons indicate which patients have dropped out of treatment and which have returned, further allowing busy clinic staff to focus their efforts on those at highest risk for missing an appointment.

Patients who have missed their scheduled clinic visits will also show up on a menu labeled "Missed Appointments." Just like the "Future Appointments" menu, this is intended to facilitate outreach to patients by allowing staff to easily contact them to determine why they have missed their visits and to schedule a new appointment.




Missed and future appointments modules in CAST

# IMPLEMENTATION

The Ponseti method was pioneered at the University of Iowa where Dr. Ponseti practiced for most of his career. MiracleFeet's founding and roots are linked to the university, thus the initial monitoring and reporting system their programs used were part of a database housed there, called the International Clubfoot Registry (ICR).

When the decision to transition from ICR to CAST was made, hundreds of thousands of records needed to be ported over to the new system. The timing of this transition corresponded with the start of each country's rollout of CAST. Two weeks prior to the CAST training in each new country, that country stopped using the ICR and collected patient information using only paper records so that ICR data could be moved. This two-week backlog was then used to train the clinic staff on how to enter records in the new application.

CAST is now in use in 371 clinics across 29 countries on three continents and storing more than 40,000 patient records that document full treatment progress and outcomes. Using data from the app, MiracleFeet has found new clinic locations in multiple West African countries, India, the Philippines, and Nepal, with locations in other countries opening later this year.

# IMPACT

Through global use of CAST, MiracleFeet is gathering data that will contribute to how the orthopedic community will manage and treat clubfoot in the future. These data will help account for different patient parameters including:

- **The optimal age of early treatment, and outcomes for older children with complex cases treated without surgical methods:** A decade ago, it was thought the Ponseti method was not viable in teenagers with neglected or relapsed clubfoot and that these cases required major surgery. MiracleFeet partners have treated 359 children over the age of 10 and can monitor their progression through treatment and long-term outcomes.

- **Variability in relapse rates and bracing compliance:** Bracing is by far the most challenging part of treatment, since children have to sleep in a brace every night for up to four years. While brace compliance has a strong positive correlation with the absence of relapses, very little data on bracing compliance is available. CAST changes that. In the future, compliance data could be measured by a sensor and the data could be sent to CAST for analysis, even triggering automated communication with parents.

- **The effectiveness of different providers:** Different types of providers, besides orthopedic surgeons, can effectively treat clubfoot. Data can be used to advocate for training more physical therapists and other paraprofessionals participating in the Ponseti method.

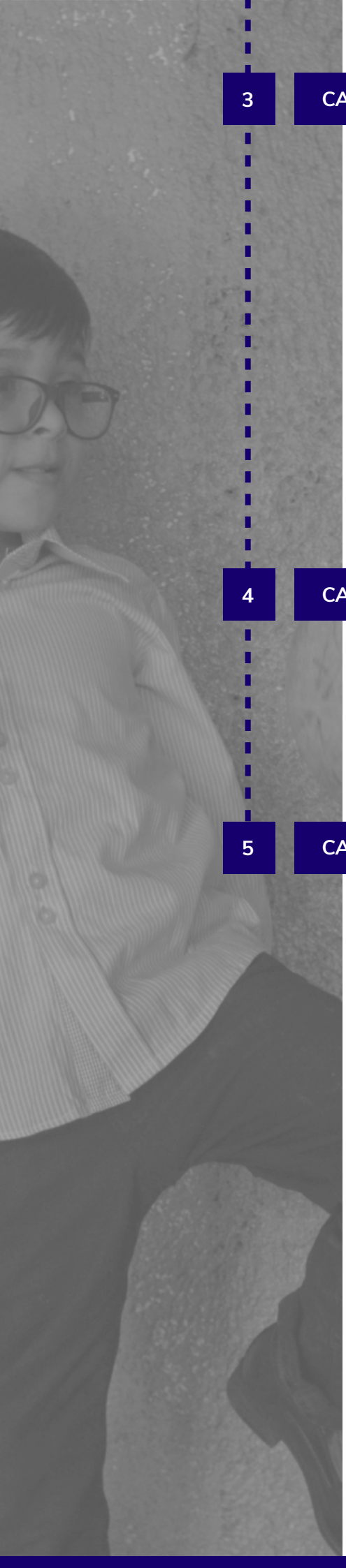
CAST has had an effect on a number of other areas related to clubfoot and its treatment around the world:

## 1 CAST facilitates local and global advocacy

Prior to CAST, most countries had no system set up to monitor clubfoot incidence and address the condition. Without data, it's hard to make a case for why clubfoot should matter to a government. With the information it collects every day, MiracleFeet and partners can now advocate at all levels for the resources, facilities, staff, and other investments needed to address a readily treatable condition and prevent lifelong disability.

## 2 CAST is more efficient for providers

Providers can now spend less time organizing and updating paper records. CAST also facilitates more effective clinic and patient management. It allows providers to easily access records for individual patients and flag extraordinary cases, as well as view aggregate treatment quality indicators.



## 3 CAST improves the patient experience

CAST improves the patient experience and facilitates prompt, encouraging communication with families through features like automated appointment reminders and encouraging informational messages. Completing clubfoot treatment requires great commitment from caregivers. Before CAST, busy providers often had little time to track down files and parents' phone numbers at the end of a clinic day to ask about their missed appointments. Now, CAST automatically sends encouraging messages to those who miss appointments, and also creates a queue of who to follow up with based on upcoming or missed appointments. Treatment status icons within patient records also flag which patients' cases might need a closer look based on any deviation from common treatment trends (e.g. more than the recommended number of casts, Pirani score increases, etc.).

## 4 CAST improves data privacy & integrity

Providers no longer carry patient files to Internet cafés to enter visit records, as they often did with the previous database. CAST has also improved data integrity through a more intuitive interface, required responses to key fields, and data validations.

## 5 CAST facilitates strategic program expansion to reach more patients

MiracleFeet uses CAST data to plan the future deployment of clinics. Unlike other conditions and public health priorities, clubfoot is not usually surveilled at a country or global level. In order to understand where the need is—where children are likely to be born with clubfoot and need treatment—MiracleFeet and other organizations have previously been required to use an estimate of prevalence applied to an estimate of population and birth rates. CAST, however, allows them to know exactly where children are coming from across geographies, which helps more accurately estimate future need for new clinics, in addition to needs related to the training and recruitment of health workers involved in the identification, referral, and treatment of new cases.

For example: Through CAST, MiracleFeet observed in 2019 that its partner in Liberia is treating 50 percent more patients in the country than are estimated to be born with clubfoot each year. The data quality is 100% verified and the cases are all legitimate and properly documented—so this tells us either 1) that the birth defect is more prevalent among certain populations and the data contributes to emerging research on questions about this or 2) that global population and birth estimates for Liberia are incorrect.

# WHAT THEY HAVE TO SAY

*"CAST is a mission-critical tool, at the heart of MiracleFeet's ability to scale quality programs that change the trajectory of vulnerable children's lives. CAST provides real-time information that enables staff and partners worldwide to make important decisions affecting treatment quality and patient outcomes every day, and the system greatly improves accountability and coordination with our in-country partners."*

Chesca Colloredo-Mansfeld

CO-FOUNDER AND EXECUTIVE DIRECTOR, MIRACLEFEET

*"We could not systematically audit 200+ clinics through staff visits. CAST gives us a way to evaluate and manage quality for scale across a growing global network of partners and providers."*

Jen Everhart

DIRECTOR OF PROGRAMS

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