

# Combating HIV by Making Breast Milk Pasteurization Safer

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## Problem

- The infantile HIV rate in South Africa is higher than any other country
- 40% of babies are infected with HIV through their mothers breast milk
- Pasteurizing breast milk before feeding it to infants is a way to prevent transmitting the virus
- However, current milk pasteurization methods have little or no quality assurance



## Guided Pasteurization

1. "Reading Temp" – temperature of the milk is being monitored
2. "Almost Done" – temperature of the milk is nearly hot enough to kill HIV
3. "Remove from Heat" – milk has reached critical temperature and jar should be moved to cold water
4. "Cooling" – temperature decreasing
5. "Wait for Approval" – data is sent to QA for analysis and response
6. Result – milk is or is not safe for use

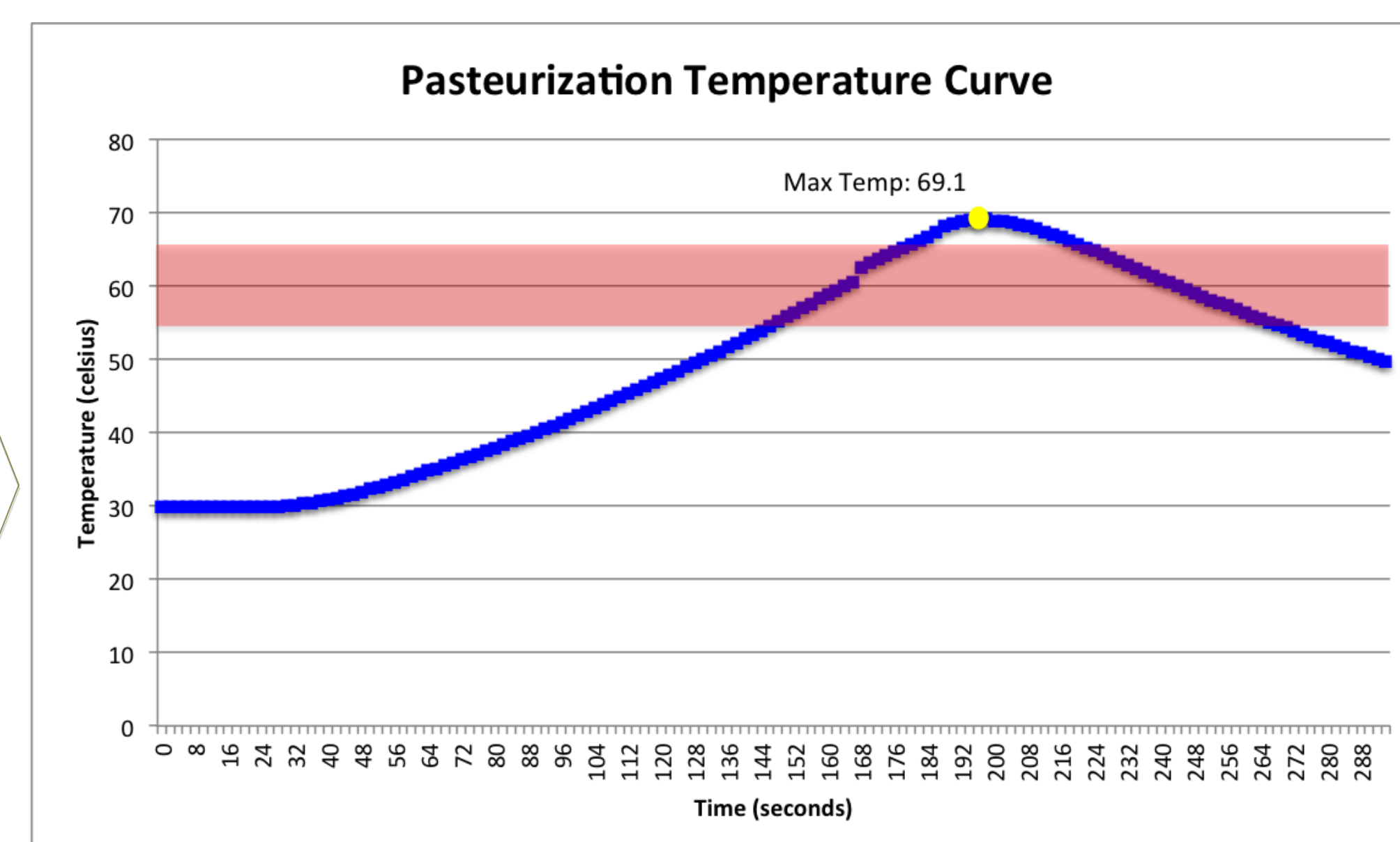
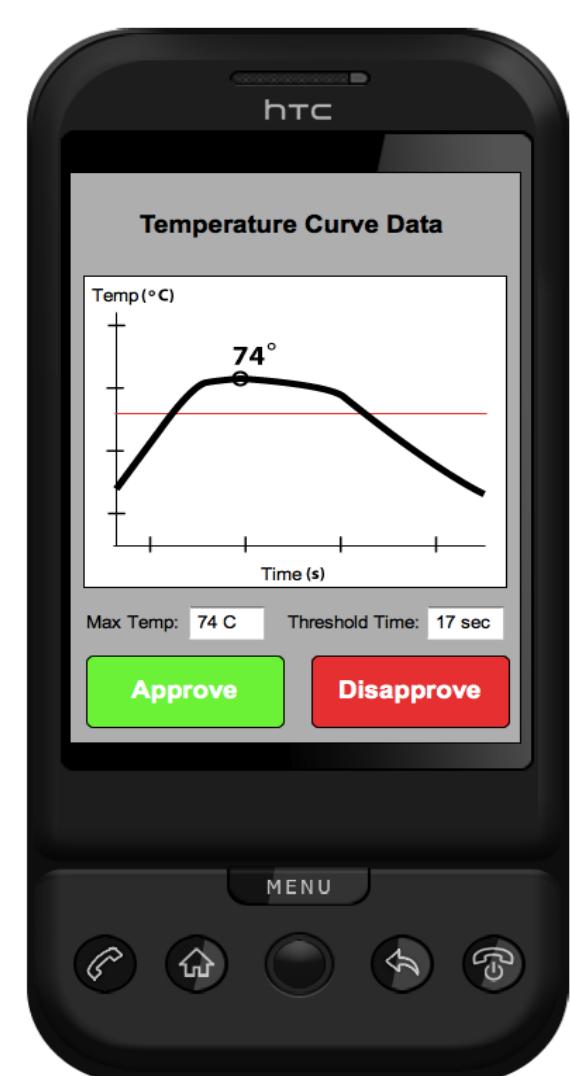
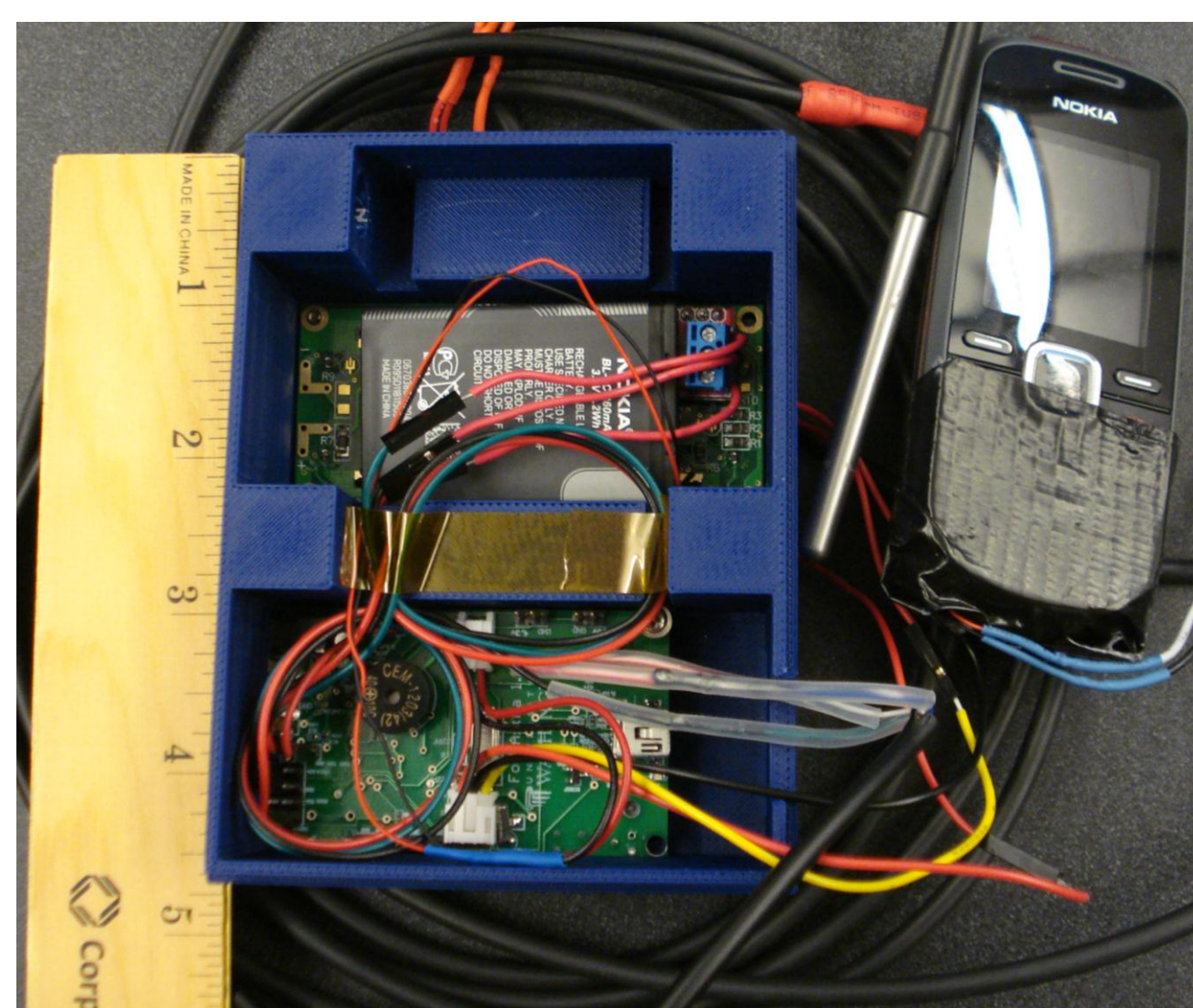


## Solution

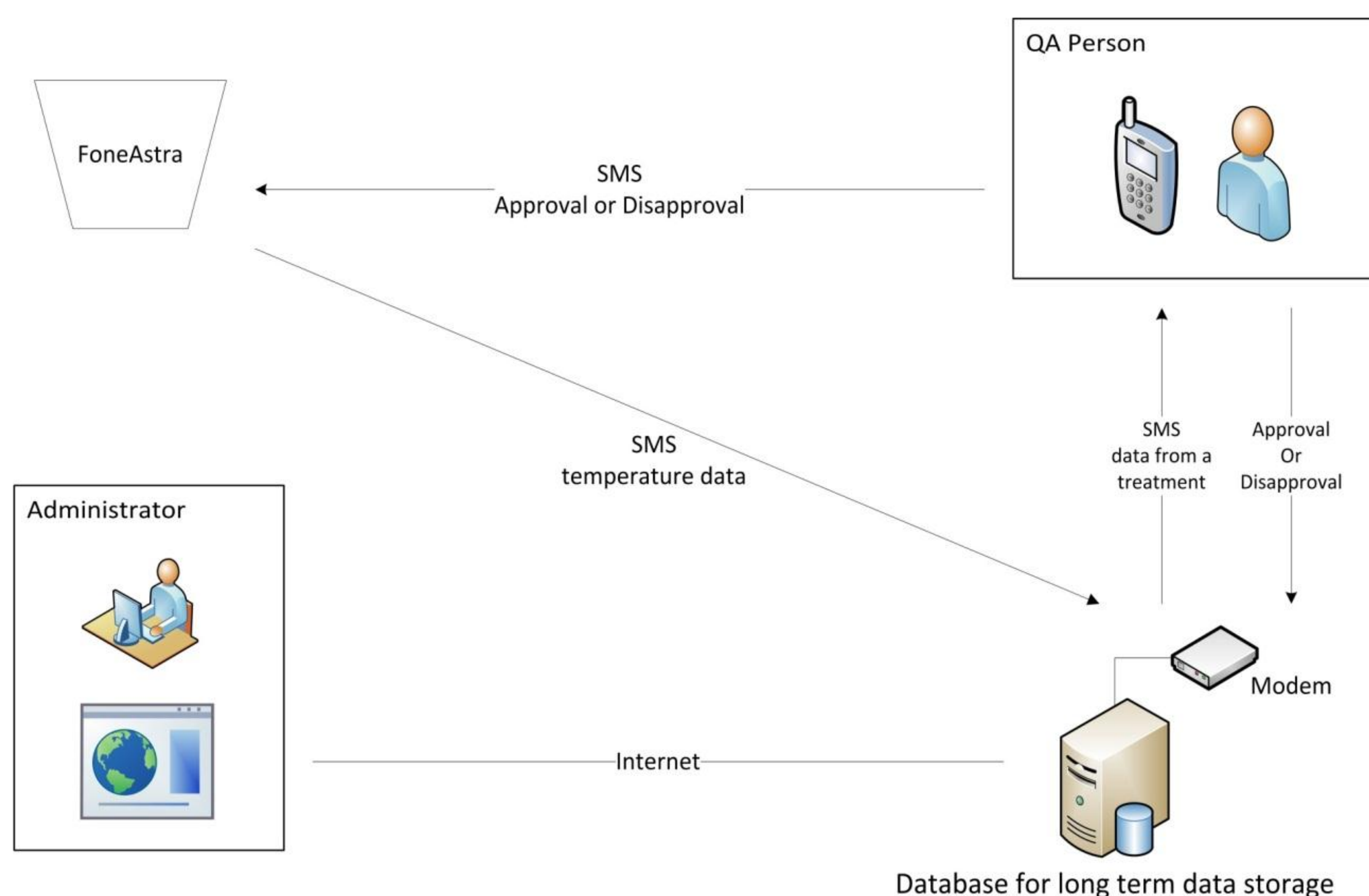
The temperature monitoring device is an adaptation of FoneAstra. The device collects temperature readings from the connected probe and uses the phone to SMS them to the server. The device uses an LCD screen, red and green LEDs, and a buzzer to guide the user through the pasteurization process.

A netbook server with a modem forwards temperature data to QA via SMS and stores the data and QA response in a database. The server also has a webpage that gives graphical views of any data set from the archive (pictured at right).

The QA application runs on an Android phone. It intercepts SMS from the server and displays a temperature curve and data summary. The QA reviews these and selects the "Approve" or "Disapprove" button, which sends a response to the device and server.



## System Data Flow



## Future Work

- Improvement to the case of the monitoring device
- Expand monitoring device functionality so it can perform multiple flash heating processes without having to receive a response from the QA
- Beta testing of the whole system in South Africa and analysis of the data collected and the research being conducted at PATH
- More sophisticated web dashboard for an administrator accessing the server
- A cheaper LCD screen integrated with the monitoring device