HL7 mFHAST Standard

Mobile Framework for Healthcare Adoption of Short-Message Technologies

Project of the HL7 Mobile Health Workgroup

HL7 mFHAST Goal

- To provide standards for communicating health services through short message technologies (SMTs) (e.g. SMS, Instant Message, Twitter, etc.)

- To increase opportunities for consumer / patient engagement and timely communication

- To improve communication and response time among providers of health services

HL7 mFHAST Importance

- Brevity of message for bandwidth sensitive settings (e.g. LMIC, Rural Health)

- Brevity of message for increasing human processing and response

- Increased opportunities for low infrastructure settings

mFHAST Status

- Evolved out of mHealth Low & Middle Income Countries (LMIC) sub-workgroup activities

- HL7 project/product (normative standard) in development

- Project approved by HL7 SD April 2015

- Approved by TSC September 2015

- Meeting Thursdays @ 2pm EST

mFHAST Short-message Concept

- Short messages within the mFHAST standard are meant to be
    - Brief
    - Low Payload
    - Easily Processed by Humans at its endpoint
    - Orientation is for fast, meaningful communication between people and care providers using garden variety technologies with no assumption of having sophisticated apps or services

Short-message Technology Basics

- "Short-Message Technology" encompasses the realm of technologies related to SMS, text messages, instant messages (e.g., iMessage, FaceBook Message, Twitter, WhatsApp, Google Chat, Unstructured Supplementary Service Data (USSD) messages etc..)
- Emphasizing brief messages of approximately 160+/- characters
- Low-cost, low infrastructure, low learning-curve

OTT vs SMS

- OTT - over-the-top messaging is third parties providing instant messaging services as an alternative to text messaging services provided by a mobile network operator, particularly WhatsApp, which is narrowly focused to replace text messaging on Internet connected smartphones.

- Traditional SMS – Cellular network based data transmission limited to approximately 145-160 characters.

How does 160 bytes/characters feel?

This is an example message of 160 bytes/characters:

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus eget mauris a nisi ultricies fermentum. Quisque ac rutrum dolor, in dictum augue. Sed volutpat.

SMS Use Case –
Ebola Disease Management

Initial set of key Ebola messages is broadcast to all subscribers

An individual dials *112# from their mobile phone. The service is marketed via mobile, TV, radio and other channels

A USSD or IVR service is triggered in response to *112#

Two basic options:
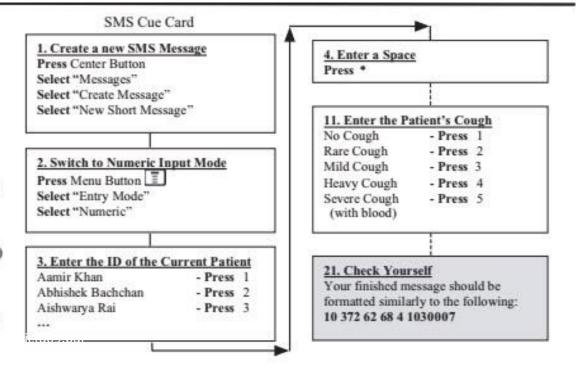1. Report a case
2. Request information

SMS Use Case – TB

SMS Cue Card

SMS + Cue Card Interface

General Strengths
Can be used with any phone
Ongoing cost is low (SMS)
Many workers familiar with SMS

b)

General Weaknesses
Requires basic literacy skills
Changing survey requires new cue card
Hard to enter in free-form notes
No confirmed receipt of data delivery
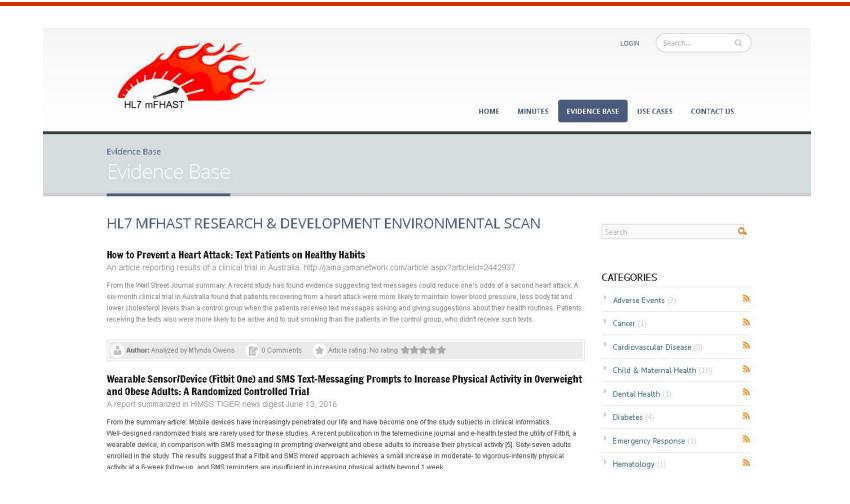Worker can forget or lose cue card
Quite easy to fake visits (copy old SMS)

Our Results: Accuracy & Efficiency
We measured 4.5 errors per 100 entries
The average interaction was 97 seconds

1. Create a new SMS Message
Press Center Button
Select "Messages"
Select "Create Message"
Select "New Short Message"

2. Switch to Numeric Input Mode
Press Menu Button ☰
Select "Entry Mode"
Select "Numeric"

3. Enter the ID of the Current Patient
Aamir Khan   - **Press** 1
Abhishek Bachchan   - **Press** 2
Aishwarya Rai   - **Press** 3
...

4. Enter a Space
Press *

11. Enter the Patient's Cough
No Cough   - **Press** 1
Rare Cough   - **Press** 2
Mild Cough   - **Press** 3
Heavy Cough   - **Press** 4
Severe Cough   - **Press** 5
(with blood)

21. Check Yourself
Your finished message should be
formatted similarly to the following:
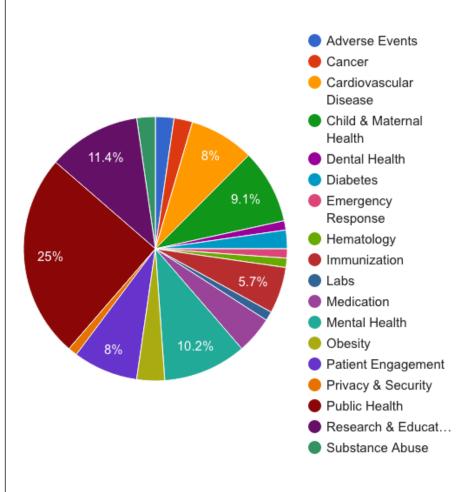**10 372 62 68 4 1030007**

Short-Message Standards Needs

- Reducing health data silos due to ad-hoc constructs
- Increased interoperability between interventions
- Improved aggregation and processing of collected data
- Sustainability of data collection and reporting efforts
- Control cost of adoption through development of templates and guidelines
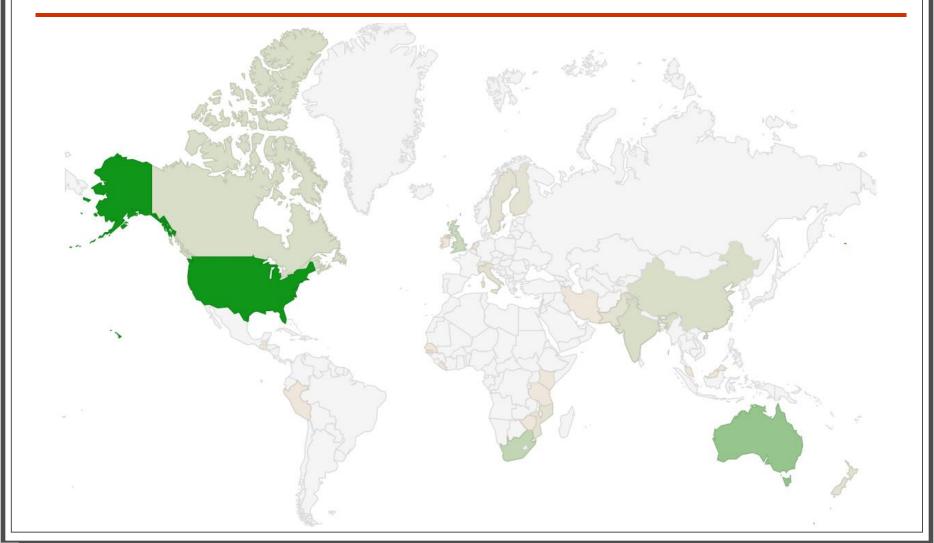- Re-usability across various interventions and mediums

mFHAST.org Evidence-Base

HL7 mFHAST Workgroup Preliminary Findings: Domain

Legend:
- Adverse Events
- Cancer
- Cardiovascular Disease
- Child & Maternal Health
- Dental Health
- Diabetes
- Emergency Response
- Hematology
- Immunization
- Labs
- Medication
- Mental Health
- Obesity
- Patient Engagement
- Privacy & Security
- Public Health
- Research & Educat…
- Substance Abuse

Pie chart values: 8%, 9.1%, 11.4%, 25%, 5.7%, 10.2%, 8%

% of Total (n=75)	Healthcare Domain
24%	Public Health
12%	Research & Education
10%	Child & Maternal Health
9%	Mental Health
9%	Patient Engagment
8%	CardiovascularDisease
5%	Immunizations
4%	Diabetes
4%	Medication
3%	Substance Abuse

mFHAST Preliminary Findings: Region

Preliminary mFHAST Implications

- ## SMT Intervention findings suggest:

  - Ability of targeted text messages to improve lifestyle decisions toward cardiovascular health

  - Effectiveness of SMS mobile health methods for improving frontline health worker adherence to treatment guidelines

  - Opportunity for text-message based reinforcement to increase effectiveness of a behavioral intervention (encouraging increased walking habits)

  - Effectiveness of short messages for increasing adherence to malaria therapies

  - Standards for insulin titration through SMS methods within underserved populations.

mFHAST Comment-Only Ballot

- Working through development of comment-only ballot for Q4 2016

- Consisting of core requirements framework for mFHAST messages

mFHAST Ballot Outline

- **Proposed Ballot Outline**
  - Overview
  - Evidence-Base Findings
  - Content
    - Message Format
    - Conformance Statements
    - Definitions
  - Implementation Use Cases
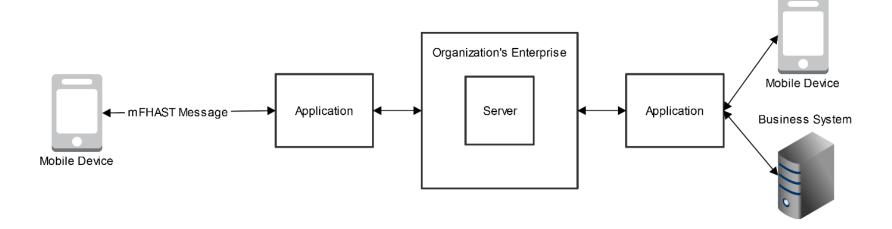
mFHAST Contextual Requirements

- SHALL have at least one actor that is human

- SHALL use a message with a UI brevity of approximately 160 characters
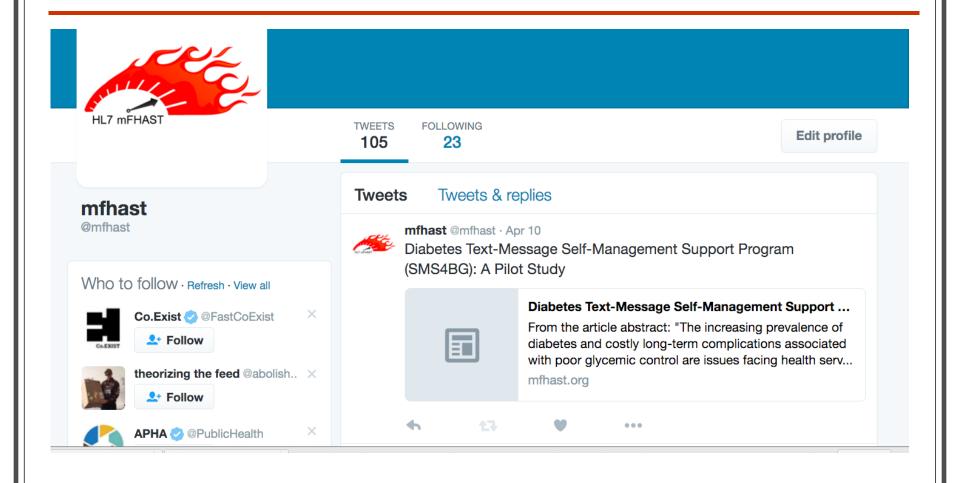
mFHAST Message Requirements

- ***mFHAST Message Requirements***

- SHALL have an id identifying the organization that owns the message
- SHALL have a unique message identifier
- SHALL have a designation as to the activity or type of message
- SHALL include the date and time the message was sent
- SHALL have a recipient identifier
- SHOULD be composed of a documented structure
- SHOULD utilize secure messaging where applicable
- SHOULD [IF] utilize dedicated short codes when a response request is initiated

mFHAST Implementation

Healthcare Short-Message Technology Promotion & Dissemination

mFHAST Project Timeline 2016

- Q1-Q4 2016: Environmental Scan, White paper development
- Q4 2016: Comment Only Ballot to be submitted
- Q1 2017: Ballot reconciliation
- Q2-Q3 2017: STU Development
- Q4 2017: STU Ballot to be submitted

mFHAST Open Questions

- **Framework**
  - Balance between flexibility and standardization
  - Privacy and need
  - Bandwidth vs Metadata
- **Emoji vs text-based requirements**

Project and contact information

- Standing meetings are on Thursdays at 2 PM Eastern

- Project Evidence Base: http://mfhast.org/

- Project Lead: Nathan Botts, Westat Center for Health IT, nathanbotts@westat.com