HL7 mFHAST Standard

mobile Frameworks for Healthcare Adoption of Short-Message Technologies

Project of the HL7 Mobile Health Workgroup

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mFHAST Goal

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

- Increase opportunities for patient engagement and communication

mFHAST Status

- Evolved out of mHealth LMIC sub-workgroup activities

- New HL7 project/product (normative standard) in development

- Approved by HL7 SD April 2015

- Awaiting approval by TSC

- Meeting Thursdays @ 2pm EST

Short-message Tech in Healthcare

Multiple global short-message studies have reported success in improving health outcomes and activities related to:

- Smoking cessation
- Diabetes
- Weight management
- HIV
- Medication adherence
- Appointment attendance
- Activity/Fitness Monitors

- Telehealth/eConsultation
- Pandemic Tracking (e.g. Ebola)
- Immunization/Vaccination

mFHAST Domain Examples

- Clinical reminders (e.g., appointments, treatments)

- Health Education

- Vital Records

- Disaster Reporting

- Adverse Event Reporting

- Telehealth

- eConsultation

- Community health mobilization

- Public Health and Emergency Response

- Surveillance and Tracking

- Maternal & Child Health

Short-message Basics

- "Short-Message" encompasses the realm of technologies related to SMS, text messages, instant messages, Twitter, Unstructured Supplementary Service Data (USSD),etc

- Messages composed of approximately 140-160 characters

- Estimated that upwards of 200,000 SMS messages are sent every second

- Low-cost, low infrastructure, low learning-curve

- Currently predicted that instant messaging (MIM) carries upwards of twice the volume (50 billion per day) of messages than SMS (Deloitte 2014)

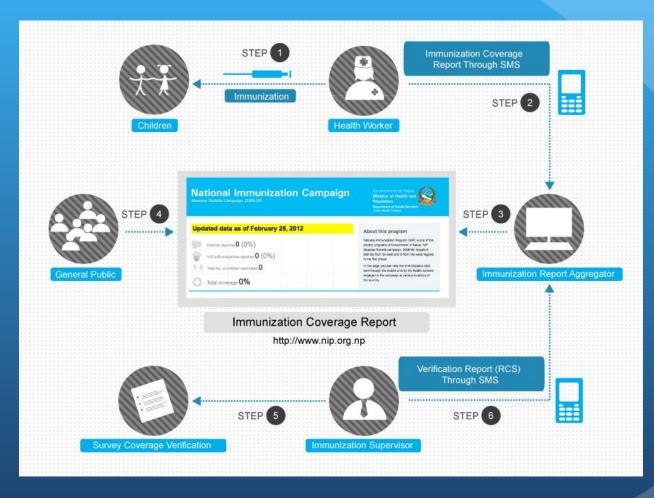# How does 140 characters feel?

This is an example of 140 characters:

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nunc eu fermentum urna. Vestibulum rhoncus non nisl eu malesuada. Duis turpis duis.

SMT Clinical Use Illustration

Mayo Clinic Health System — Franciscan Healthcare patients can choose to receive text message reminders in place of the automated telephone reminder for upcoming clinic, lab and rehabilitation appointments that are made two or more days in advance.

Patients must provide their cell phone number and elect to participate in the service by texting "MCHS" to 622622. Patients who elect to receive this service can sign up anytime to receive reminder texts for all future appointments.

SMS Use Case - Immunization

SMS Use Case – Maternal/Child Health

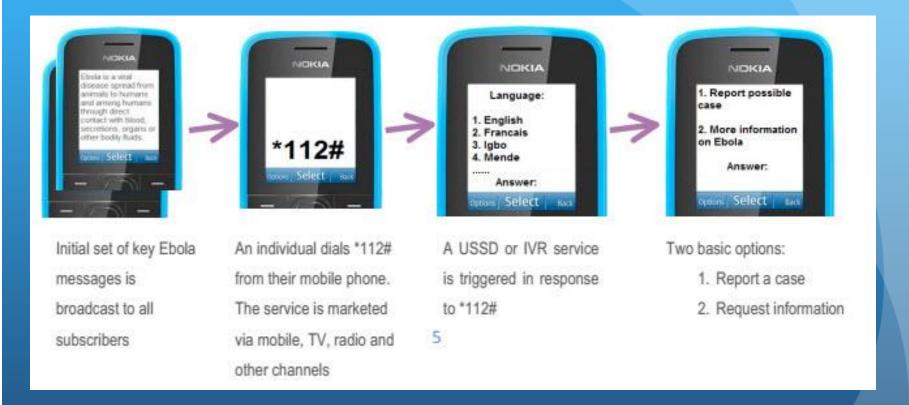**Set Up Free Appointment Reminders with Text4baby**
1. Text REMIND (or CITA for Spanish) to 511411.
2. Enter appointment date. Enter 7/7/2014 as 07072014.
3. Enter appointment description with time, place and purpose (ex. 3pm apt w Dr Parker).
4. Reminder text will be sent three days before and the morning of appointment.
5. You can set up as many reminders as you need, at any time.

Reference: https://www.text4baby.org

Findings:
- Increased perception of being prepared to be a mother
- Increased acknowledgment of the dangers of alcohol consumption during pregnancy
- Potential Barrier: Enrollment increases with level of literacy

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

5

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

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

Reference: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/10/gsma-Ebola-Mobile-Response-Blueprint.pdf
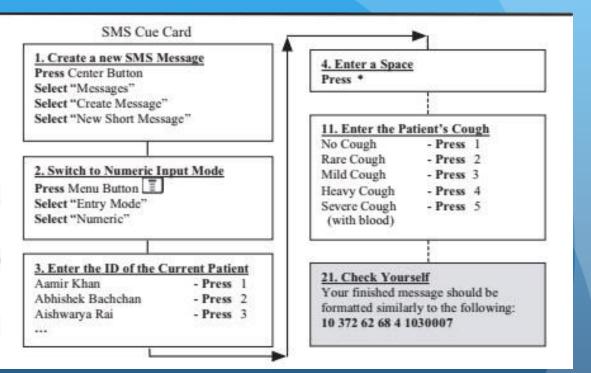
SMS Use Case – TB

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

Reference: http://www.cs.cmu.edu/~ebrun/patnaik-ictd09.pdf
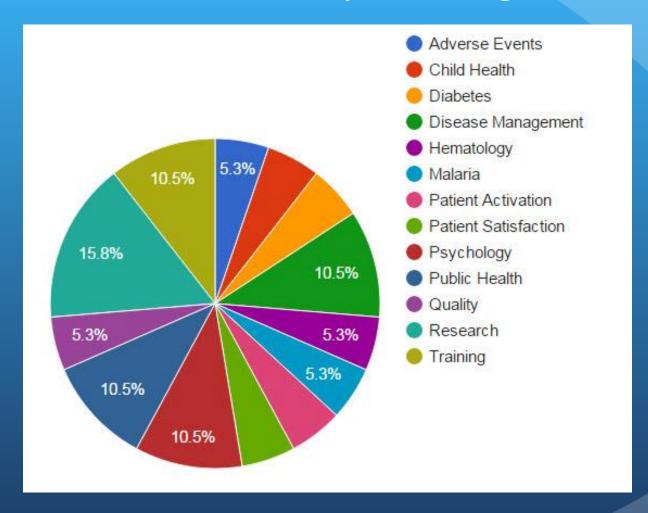
Short-Message Standards Development

Reference: http://www.souktel.org/sites/default/files/resources-files/Towards-a-Code-of-Conduct-SMS-Guidelines.pdf

mFHAST Whitepaper Development

- Purpose: Scoping and Education of mFHAST Domain

- Outline:
  - SMT Background
    - SMT Workflow
    - SMT Structures
  - Methods
    - Lit review
    - Environmental scan
  - Results & Discussion
    - Current domain of SMT interventions
    - Standards development implications

mFHAST Preliminary Findings: Domain

Legend:
- Adverse Events
- Child Health
- Diabetes
- Disease Management
- Hematology
- Malaria
- Patient Activation
- Patient Satisfaction
- Psychology
- Public Health
- Quality
- Research
- Training

Pie chart values: 5.3%, 10.5%, 10.5%, 5.3%, 5.3%, 5.3%, 10.5%, 10.5%, 5.3%, 15.8%, 10.5%

mFHAST Preliminary 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.

Short-message Barriers

- Ad-hoc implementations

- Lack of interoperability

- Security/Privacy/Consent

- Message size

- Stateless (at its most basic implementation)

- Cost of message

- Governmental and organizational policy and barriers

mFHAST Pathway of Inquiry

- What is the issue?

- What are the critical variables? (e.g., prioritization, response)

- What are the privacy/security/consent variables required?

- Who initiates/consumes/stores the message?

- What format/architectures are required?

- What are the temporal considerations?

- What are the limitations?

Short-Message Actors

- Healthcare Providers (at all levels)

- Business

- Organizations (e.g., Non-profit, NGOs)

- Governments

- People (Families, Peers, Public)

- Systems

mFHAST Communication Structures

- Coded Response

- Short codes (reference sets)

- Free Text

- Structured Response

- API Interactions & Transformations

mFHAST Future and Beyond

- Space exploration health needs…

- Extreme remote and boundary cases
  - Low density population areas
  - High Altitude populations
  - Oceanic exploration

- Extremely low-bandwidth environments

- Transmission speeds
  - Requirements when high throughput is paramount

mFHAST Project Timeline 2015

- Q1 2015 – PSS submission, Documentation, education, use case development and requirements gathering

- Q2 2015 – Project approval at HL7 Paris Meeting, Use Case development

- Q3 2015 – Environmental Scan, White paper development

- Q4 2015 – Comment only draft developed

- Q1 2016: (1st) Ballot

Related and Associated Organizations & Projects

SDO/Organizations

- HL7 EHR/PHR/FHIR/Medical Devices/PHER

- WHO eHealth Standardization and Interoperability Recommendations

- ISO/AHIMA/OASIS/IEEE/HIMSS

Initiatives

- Mobile Alliance for Maternal Action (MAMA) in Bangladesh and South Africa

- Millennium Development Goals

- mPowering Frontline Health Workers

- Saving One Million Lives initiative

- Asia e-Health Information Network

Organizations

- US Centers for Disease Control

- U.S. Office of the National Coordinator for Health Information Technology

- World Health Organization

- United Nations Foundation

- USAID / UNICEF

- mHealth Alliance

- Johnson & Johnson

- Gates Foundation

Appendix

Short-Message Communication Methods

- Reminders

- Broadcasts (e.g., Alerts, Alarms)

- Education/Decision Support

- Structured Data Collection

- Interactive Health Communication