



# HL7 mFHASt Standard

Mobile Framework for Healthcare Adoption  
of Short-Message Technologies

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Project of the HL7 Mobile Health Workgroup

# HL7 mFHAST Goal

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- 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 mFHA<sup>ST</sup> Importance

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- 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

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- 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

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- 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

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- “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

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- 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?

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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

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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

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# SMS Use Case – TB

## SMS + Cue Card Interface

### General Strengths

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

### General Weaknesses

- b)
- 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

## SMS Cue Card

### 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 (with blood)	- Press 5

### 21. Check Yourself

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

# Short-Message Standards Needs

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- 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 RESEARCH & DEVELOPMENT ENVIRONMENTAL SCAN

### How to Prevent a Heart Attack: Text Patients on Healthy Habits

An article reporting results of a clinical trial in Australia. <http://jama.jamanetwork.com/article.aspx?articleid=2442937>

From the Wall Street Journal summary: A recent study has found evidence suggesting text messages could reduce one's odds of a second heart attack. A six-month clinical trial in Australia found that patients recovering from a heart attack were more likely to maintain lower blood pressure, less body fat and lower cholesterol levels than a control group when the patients received text messages asking and giving suggestions about their health routines. Patients receiving the texts also were more likely to be active and to quit smoking than the patients in the control group, who didn't receive such texts.

 **Author:** Analyzed by M'lynda Owens  0 Comments  Article rating: No rating ★★★★★

### Wearable Sensor/Device (Fitbit One) and SMS Text-Messaging Prompts to Increase Physical Activity in Overweight and Obese Adults: A Randomized Controlled Trial

A report summarized in HIMSS TIGER news digest June 13, 2016

From the summary article: Mobile devices have increasingly penetrated our life and have become one of the study subjects in clinical informatics. Well-designed randomized trials are rarely used for these studies. A recent publication in the telemedicine journal and e-health tested the utility of Fitbit, a wearable device, in comparison with SMS messaging in prompting overweight and obese adults to increase their physical activity [5]. Sixty-seven adults enrolled in the study. The results suggest that a Fitbit and SMS mixed approach achieves a small increase in moderate- to vigorous-intensity physical activity at a 6-week follow-up and SMS reminders are insufficient in increasing physical activity beyond 1 week.

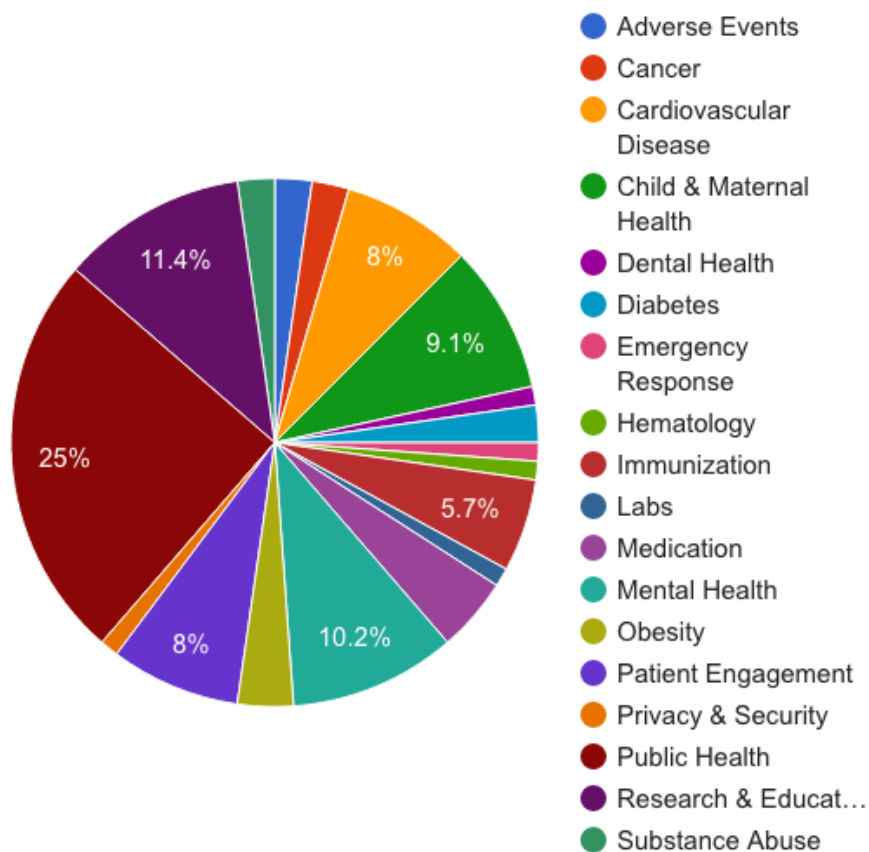
Search 

### CATEGORIES

- Adverse Events (2) 
- Cancer (1) 
- Cardiovascular Disease (6) 
- Child & Maternal Health (10) 
- Dental Health (1) 
- Diabetes (4) 
- Emergency Response (1) 
- Hematology (1) 

# HL7 mFHASt Workgroup

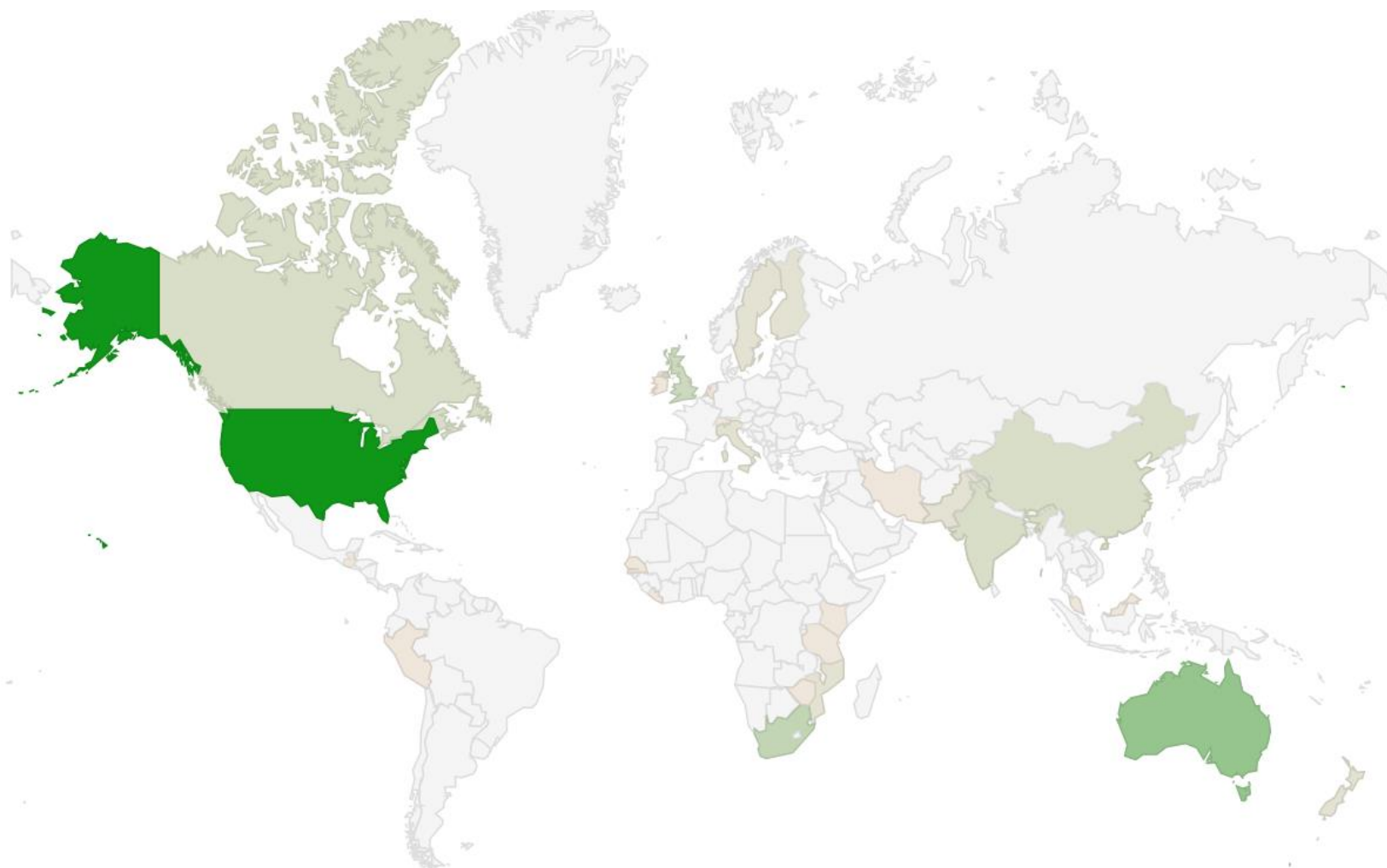
## Preliminary Findings: Domain



% 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

# mFHA<sup>ST</sup> Preliminary Findings: Region

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# Preliminary mFHASt Implications

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- 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

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- Working through development of comment-only ballot for Q4 2016
- Consisting of core requirements framework for mFHASt messages



# mFHASt Ballot Outline

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- Proposed Ballot Outline

- Overview
- Evidence-Base Findings
- Content
  - Message Format
  - Conformance Statements
  - Definitions
- Implementation Use Cases

# mFHASt Contextual Requirements

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- SHALL have at least one actor that is human
- SHALL use a message with a UI brevity of approximately 160 characters

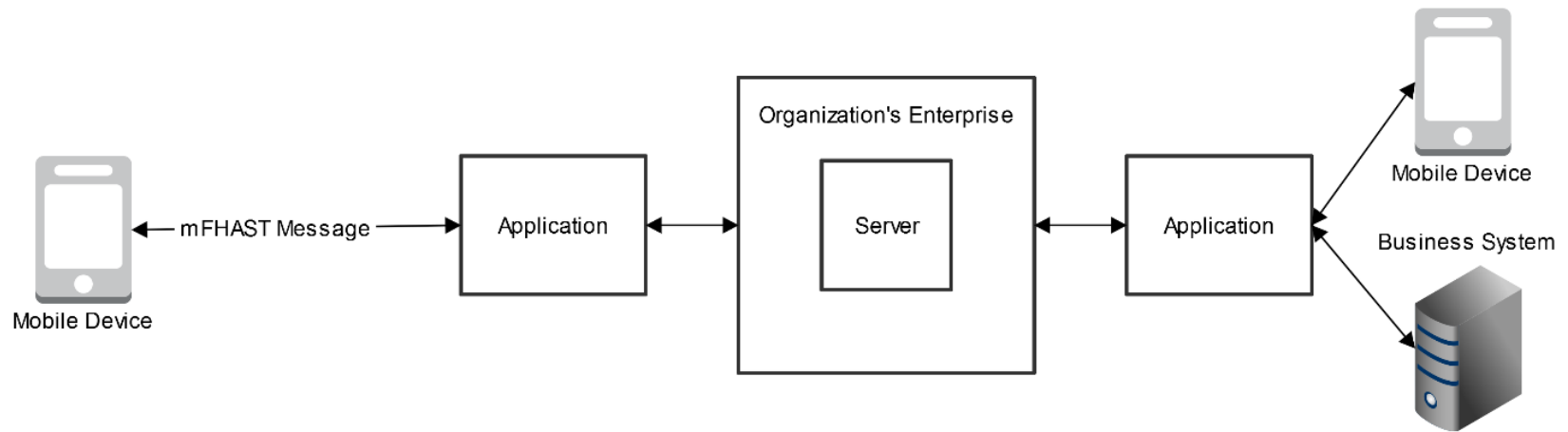
# mFHASt Message Requirements

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- **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

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# Healthcare Short-Message Technology Promotion & Dissemination



HL7 mFHASt


TWEETS  
105


FOLLOWING  
23


Edit profile


**mfhast**  
@mfhast

Who to follow · Refresh · View all





Co.Exist  @FastCoExist


 Follow




theorizing the feed @abolish..

 Follow




APHA  @PublicHealth





Tweets Tweets & replies



**mfhast** @mfhast · Apr 10  
Diabetes Text-Message Self-Management Support Program (SMS4BG): A Pilot Study



**Diabetes Text-Message Self-Management Support ...**  
From the article abstract: "The increasing prevalence of diabetes and costly long-term complications associated with poor glycemic control are issues facing health serv...  
[mfhast.org](http://mfhast.org)

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# mFHASt Project Timeline 2016

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- 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

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- Framework

- Balance between flexibility and standardization
- Privacy and need
- Bandwidth vs Metadata

- Emoji vs text-based requirements

# Project and contact information

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- 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](mailto:nathanbotts@westat.com)