• Jeanne Charleston, RN, BSN
• Casey Overby, PhD
• Daniel Mullin, PhD
• Kelly Gleason, PhD, RN
• Hailey Miller, RN, BSN
• Monica Guerrero Vazquez, MS
• Community Partners
  • Administrative Coordinator: Mary Thomas
  • Program Manager: Cassia Lewis-Land, MS
  • Deputy Director: Cheryl Dennison Himmelfarb, PhD, RN
The RIU aims are to:

• Establish a comprehensive suite of customizable services, tools, and training to promote efficient and effective local recruitment and retention;

• Develop innovative and scalable informatics approaches, including computational phenotyping, that more accurately identifies and engages potential study participants and helps research teams manage tradeoffs between sensitivity and specificity to better target those who are eligible; and

• Advance recruitment science by rigorously engaging our CTSA community and testing innovative recruitment strategies that can be implemented locally and shared nationally.
Services and Tools

- Needs Assessment
- Study Design Assessment
- Pre-screening / Cohort Discovery
- Recruitment Feasibility Survey / Focus Group
- Outreach to Stakeholder Partners
- Customized Recruitment and Retention Plans
- Recruitment and Retention Troubleshooting
- Community Research Advisory Council (C-RAC)
The MyChart Recruitment Service

• We established the MyChart Recruitment Service in 2017

• MyChart Recruitment Service uses computable phenotyping with Epic to identify study specific eligible patients and patient portal messaging to recruit eligible participants

• To date the service has been utilized by 17 research teams studying various populations and topics of interest
MyChart Recruitment Service is a multi-stage process with collaborations between:

- Core for Clinical Research Data Acquisition (CCDA)
- Program to Accelerate Clinical Research using Epic (PACE)
- Recruitment Innovation Unit (RIU)

- MyChart Recruitment Team meets with the study team to discuss project details and determine fit for the service
- Data Analytics manager meets with study team to determine feasibility of inclusion criteria
- After IRB and committee approval, the analytics team creates a query for computational phenotyping of the target population
- Analytics team sends the database query to the EMR team
- EMR team member applies the database query to create a report of eligible patients
- Service staff use the EMR report to send messages to the eligible patients identified through the query
- Interested patients contact the study team to pursue participation in the study
MyChart User Representativeness:

- 40% of JHHS patients were active MyChart users.
- Similar to JHHS population in terms of age and sex.
- More likely to be white and non-Hispanic.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Johns Hopkins Health System*+</th>
<th>Active MyChart Users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total N (%)</strong></td>
<td>1,308,820 (100)</td>
<td>519,800 (40)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>746,027 (57)</td>
<td>313,888 (60)</td>
</tr>
<tr>
<td>Male</td>
<td>562,792 (43)</td>
<td>205,890 (40)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>327,205 (25)</td>
<td>97,100 (19)</td>
</tr>
<tr>
<td>White</td>
<td>772,204 (59)</td>
<td>355,134 (68)</td>
</tr>
<tr>
<td>Asian</td>
<td>65,441 (5)</td>
<td>35,424 (6)</td>
</tr>
<tr>
<td>Other</td>
<td>143,970 (11)</td>
<td>41,714 (8)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>1,164,850 (89)</td>
<td>475,779 (92)</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>78,529 (6)</td>
<td>22,094 (4)</td>
</tr>
<tr>
<td>Unknown/Patient refused</td>
<td>65,441 (5)</td>
<td>20,975 (4)</td>
</tr>
<tr>
<td><strong>Age in Years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-17</td>
<td>217,590 (17)</td>
<td>37,182 (7)</td>
</tr>
<tr>
<td>18-39</td>
<td>327,600 (25)</td>
<td>134,972 (26)</td>
</tr>
<tr>
<td>40-59</td>
<td>343,160 (26)</td>
<td>156,917 (30)</td>
</tr>
<tr>
<td>60-79</td>
<td>333,590 (25)</td>
<td>144,021 (28)</td>
</tr>
<tr>
<td>80+</td>
<td>86,900 (7)</td>
<td>26,880 (5)</td>
</tr>
</tbody>
</table>

*Includes individuals that have had at least one diagnosis, medication order, laboratory result, OR procedure since 9/1/2016.
*Data in JHHS column do not include individuals greater than 90.
### Study Characteristics

<table>
<thead>
<tr>
<th>Population Age</th>
<th>Health Concern</th>
<th>Report Size</th>
<th>Message Batch Size</th>
<th>Frequency</th>
<th>Duration (in mos.) *</th>
<th>Response Rate*</th>
<th>Eligibility Rate*</th>
<th>Enrollment Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>70+</td>
<td>Vitamin D and Falling</td>
<td>6896</td>
<td>250-1000</td>
<td>Bimonthly</td>
<td>5</td>
<td>116 (1.7)</td>
<td>49 (0.7)</td>
<td>12 (0.2)</td>
</tr>
<tr>
<td>&lt;1</td>
<td>Peanut Allergies</td>
<td>409</td>
<td>Variable</td>
<td>Monthly</td>
<td>3</td>
<td>16 (4.3)</td>
<td>11 (3.0)</td>
<td>10 (2.7)</td>
</tr>
<tr>
<td>&gt;18</td>
<td>Atrial Fibrillation</td>
<td>1303</td>
<td>303-1000</td>
<td>Monthly</td>
<td>2</td>
<td>127 (9.7)</td>
<td>127 (9.7)</td>
<td>127 (9.7)</td>
</tr>
<tr>
<td>50-90</td>
<td>Type II Diabetes</td>
<td>1382</td>
<td>250</td>
<td>Monthly</td>
<td>6</td>
<td>34 (2.5)</td>
<td>1 (0.07)</td>
<td>0</td>
</tr>
<tr>
<td>18-45</td>
<td>Asthma</td>
<td>1599</td>
<td>200</td>
<td>Monthly</td>
<td>7</td>
<td>44 (3.1)</td>
<td>9 (0.6)</td>
<td>9 (0.6)</td>
</tr>
<tr>
<td>&gt;18</td>
<td>Diet and Gout</td>
<td>1229</td>
<td>250-500</td>
<td>Bimonthly</td>
<td>3</td>
<td>53 (4.1)</td>
<td>20 (1.6)</td>
<td>9 (0.7)</td>
</tr>
</tbody>
</table>

### Messaging Characteristics

<table>
<thead>
<tr>
<th>Population Age</th>
<th>Health Concern</th>
<th>Report Size</th>
<th>Message Batch Size</th>
<th>Frequency</th>
<th>Duration (in mos.) *</th>
<th>Response Rate*</th>
<th>Eligibility Rate*</th>
<th>Enrollment Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;40</td>
<td>COPD</td>
<td>14336</td>
<td>250-1000</td>
<td>Variable</td>
<td>16</td>
<td>84 (1.5)</td>
<td>2 (0.03)</td>
<td>2 (0.03)</td>
</tr>
<tr>
<td>3-13</td>
<td>Brain and Appetite</td>
<td>3719</td>
<td>250-500</td>
<td>Bimonthly</td>
<td>4</td>
<td>48 (1.8)</td>
<td>16 (0.6)</td>
<td>12 (0.4)</td>
</tr>
<tr>
<td>18-80</td>
<td>COPD</td>
<td>1171</td>
<td>200</td>
<td>Monthly</td>
<td>5</td>
<td>43 (4.1)</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### Active Recruitment

<table>
<thead>
<tr>
<th>Population Age</th>
<th>Health Concern</th>
<th>Report Size</th>
<th>Message Batch Size</th>
<th>Frequency</th>
<th>Duration (in mos.) *</th>
<th>Response Rate*</th>
<th>Eligibility Rate*</th>
<th>Enrollment Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>Peanut Allergies</td>
<td>2083</td>
<td>200</td>
<td>Variable</td>
<td>11</td>
<td>7 (0.3)</td>
<td>4 (0.2)</td>
<td>3 (0.1)</td>
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<tr>
<td>13-22</td>
<td>Weight Loss</td>
<td>9978</td>
<td>150-1000</td>
<td>Monthly</td>
<td>17</td>
<td>135 (0.9)</td>
<td>44 (0.3)</td>
<td>44 (0.3)</td>
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<tr>
<td>&gt;18</td>
<td>Mood Disorders in Pregnancy</td>
<td>1868</td>
<td>350</td>
<td>Monthly</td>
<td>9</td>
<td>116 (5.0)</td>
<td>56 (2.4)</td>
<td>21 (1.0)</td>
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<tr>
<td>4-17</td>
<td>Mood Disorders</td>
<td>15709</td>
<td>250-1000</td>
<td>Bimonthly</td>
<td>10</td>
<td>66 (0.5)</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>&gt;18</td>
<td>Anemia</td>
<td>9096</td>
<td>500</td>
<td>Bimonthly</td>
<td>8</td>
<td>166 (2.4)</td>
<td>1 (0.00)</td>
<td>1 (0.00)</td>
</tr>
</tbody>
</table>

### Completed Recruitment

<table>
<thead>
<tr>
<th>Population Age</th>
<th>Health Concern</th>
<th>Report Size</th>
<th>Message Batch Size</th>
<th>Frequency</th>
<th>Duration (in mos.) *</th>
<th>Response Rate*</th>
<th>Eligibility Rate*</th>
<th>Enrollment Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>70+</td>
<td>Vitamin D and Falling</td>
<td>6896</td>
<td>250-1000</td>
<td>Bimonthly</td>
<td>5</td>
<td>116 (1.7)</td>
<td>49 (0.7)</td>
<td>12 (0.2)</td>
</tr>
<tr>
<td>&lt;1</td>
<td>Peanut Allergies</td>
<td>409</td>
<td>Variable</td>
<td>Monthly</td>
<td>3</td>
<td>16 (4.3)</td>
<td>11 (3.0)</td>
<td>10 (2.7)</td>
</tr>
<tr>
<td>&gt;18</td>
<td>Atrial Fibrillation</td>
<td>1303</td>
<td>303-1000</td>
<td>Monthly</td>
<td>2</td>
<td>127 (9.7)</td>
<td>127 (9.7)</td>
<td>127 (9.7)</td>
</tr>
<tr>
<td>50-90</td>
<td>Type II Diabetes</td>
<td>1382</td>
<td>250</td>
<td>Monthly</td>
<td>6</td>
<td>34 (2.5)</td>
<td>1 (0.07)</td>
<td>0</td>
</tr>
<tr>
<td>18-45</td>
<td>Asthma</td>
<td>1599</td>
<td>200</td>
<td>Monthly</td>
<td>7</td>
<td>44 (3.1)</td>
<td>9 (0.6)</td>
<td>9 (0.6)</td>
</tr>
<tr>
<td>&gt;18</td>
<td>Diet and Gout</td>
<td>1229</td>
<td>250-500</td>
<td>Bimonthly</td>
<td>3</td>
<td>53 (4.1)</td>
<td>20 (1.6)</td>
<td>9 (0.7)</td>
</tr>
</tbody>
</table>

### Efficacy Rates

- The average response rate was 3%
- The average eligibility rate was 1.6%
- The average enrollment rate was 1.13%
Terms and Conditions

To proceed, you must agree to the following conditions governing the use of this Web site.

Information maintained on Johns Hopkins Medicine MyChart presents unique security and privacy issues as addressed below. Therefore, certain necessary measures for protecting the security and privacy of such information are the responsibility of the user as detailed below.

The information from your medical record available through Johns Hopkins Medicine MyChart may not constitute your entire medical record. The scope of medical record information accessible through Johns Hopkins Medicine MyChart is determined at the discretion of Johns Hopkins. You will continue to have access to your complete medical record by contacting the office of your health care providers directly. THEREFORE, YOU ACKNOWLEDGE THAT JOHNS HOPKINS MEDICINE MYCHART SHALL NOT BE USED TO MAKE HEALTHCARE DECISIONS OR DIAGNOSIS AND JOHNS HOPKINS SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, INCLUDING DEATH, ARISING FROM YOUR USE OR MISUSE OF JOHNS HOPKINS MEDICINE MYCHART OR ANY INFORMATION OR CONTENT THEREIN. Remedies under these Terms of Service are sole and exclusive and are limited to those expressly provided for in these Terms of Service.

Johns Hopkins MyChart may be used to send invitations for studies you may be eligible to participate in. For more details on this feature and how to opt out, please click here.

You are not required to utilize Johns Hopkins Medicine MyChart and may discontinue usage at any time. You acknowledge that Johns Hopkins Medicine MyChart is being provided to you without charge. Therefore, Johns Hopkins reserves the right to terminate your access to Johns Hopkins Medicine MyChart at any time, with or without cause.

Please do not show this page next time

[ACCEPT] [DECLINE]
Hello,

In addition to providing high-quality medical care, Johns Hopkins facilitates distinguished research with the ultimate goal of improving health.

I am reaching out today regarding a research study that may be of interest to you. This research study aims to: This is where you can include title, purpose of the study/why it is necessary, etc. A computer search of information in Johns Hopkins medical records found you might be eligible for this study. Specifically we are looking to identify people who XXXX and were seen at Johns Hopkins facility in the past year.

Other factors that might make you qualify to participate in this study include:

Participation in this study is voluntary. If you decide not to be part of this study, it will not change the medical care you receive.

If you are interested in participating, please contact our study team at email or phone and one of our team members would be glad to speak with you and answer any questions you may have. You may also complete this short survey and a member of our research team will contact you.

Sincerely,

PI Name
IRB Number

Mandatory signature of Dr. Ford
Daniel E. Ford, MD, MPH
Vice Dean for Clinical Investigation
Director, Institute for Clinical and Translational Research
ICTR Research Recruitment Office

Mandatory language required
Participation in this study is voluntary. If you decide not to be part of the study, it will not change the medical care you receive. For more information and frequently asked questions (FAQs) related to research recruitment through MyChart, visit
Report Display in Epic
## Selecting Eligible Patents

<table>
<thead>
<tr>
<th>DOB</th>
<th>Patient Age</th>
<th>Gender</th>
<th>Race</th>
<th>Ethnicity</th>
<th>Status</th>
<th>Admitted Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/10/1953</td>
<td>66 years</td>
<td>F</td>
<td>White or Caucasian</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Email MyChart</td>
</tr>
<tr>
<td>05/24/1956</td>
<td>84 years</td>
<td>F</td>
<td>Black or African American</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Email MyChart</td>
</tr>
<tr>
<td>12/10/1936</td>
<td>86 years</td>
<td>F</td>
<td>White or Caucasian</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Email MyChart</td>
</tr>
<tr>
<td>07/04/1943</td>
<td>77 years</td>
<td>F</td>
<td>Black or African American</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Email MyChart</td>
</tr>
<tr>
<td>08/22/1944</td>
<td>77 years</td>
<td>F</td>
<td>Black or African American</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Email MyChart</td>
</tr>
<tr>
<td>09/15/1942</td>
<td>75 years</td>
<td>M</td>
<td>White or Caucasian</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Mail MyChart</td>
</tr>
<tr>
<td>10/25/1949</td>
<td>71 years</td>
<td>M</td>
<td>Black or African American</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Mail MyChart</td>
</tr>
<tr>
<td>04/13/1959</td>
<td>88 years</td>
<td>F</td>
<td>White or Caucasian</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Mail MyChart</td>
</tr>
<tr>
<td>12/01/1962</td>
<td>77 years</td>
<td>M</td>
<td>Black or African American</td>
<td>Not Hispanic or Latino [1]</td>
<td>Actuated</td>
<td>(Name)</td>
<td>Email MyChart</td>
</tr>
</tbody>
</table>
Sending the Message
Message Center in Patient Portal

Message Center

Inbox | Sent Messages

Search message list | Sent by | Received Date

- Johns Hopkins Recruitment Office
  23/11/2019 04:42 PM
  Research Opportunity
  In addition to providing medical care, physicians at Johns Hopkins conduct research w

- Johns Hopkins Recruitment Office
  22/11/2019 03:24 PM
  You’re invited to Join the Daily24 Team!
  Do you wonder how the timing of your meals and sleep impacts your health? So do we!

- Johns Hopkins Medicine
  01/14/2019 03:35 PM
  Appointment Reminder
  Appointment Information

There are no more messages available.

BACK TO THE HOME PAGE
Example of MyChart Message

Research Opportunity

In addition to providing medical care, physicians at Johns Hopkins conduct research with the ultimate goal of improving health. One study that may be relevant to you is the STURDY study. STURDY is a research program conducted by the Johns Hopkins University and the National Institute of Health (NIH) that tests the effects of vitamin D supplements on the risk of falling. Every year, 1 in 3 seniors fall, and falls can have devastating effects. Some researchers think that vitamin D may help prevent falls, but we don’t know for sure.

I wanted to personally invite you to consider joining STURDY as a volunteer participant. This is an opportunity to advance our scientific understanding of vitamin D and falls. You are receiving this email because you might qualify for this study based on your age and geographic location. Participation in this study is voluntary. If you decide not to be part of this study, it will not change the medical care you receive.

If you are age 70 or older, afraid of falling or have had a fall in the past year, and are willing to take vitamin D pills, you may be eligible for STURDY.

For more information or to contact us to see if you qualify visit www.studystudy.org

Sincerely,
Daniel E. Flegal, MD, MPH
Vice Dean for Clinical Investigation
Director, Institute for Clinical and Translational Research
ICTR Research Recruitment Office

Lawrence J. Appel, MD, MPH
Principal Investigator of STURDY
Protocol #: IR00003514

Please do not respond to this MyChart message. For any questions about STURDY, please use the contact information above or on our website. For more information and frequently asked questions (FAQs) related to research recruitment through MyChart click here: lct.johnshopkins.edu/community/community-involve/with/mychart-recruitment-message/
What happens when a patient responds?

- We recently created a REDCap link that can be personalized to each study.
- These links are embedded into the message for interest patients to complete.
- After completion, the study coordinator is notified.
- An affiliated link is sent to the research coordinator to follow up on patient eligibility and enrollment status.
- These surveys track basic demographics, including race, age, ethnicity, and gender.
## Barriers and Strategies for Improvement

<table>
<thead>
<tr>
<th>Identified Barriers</th>
<th>Strategies for Improvement</th>
</tr>
</thead>
</table>
| Study team’s intake capacity                                                       | 1. Customized scheduling  
2. Controlled batch sizes  
3. REDCap survey link                                                             |
| Saturation of frequently targeted populations                                       | 1. Controlled batch sizes  
2. Strategic messaging schedule  
3. Adding eligibility criteria                                                     |
| Low response rates for general populations                                         | 1. Adding eligibility criteria to create more specific phenotypes           |
| Limited representativeness for specific populations within MyChart                | 1. Research consults  
2. TriNetX exploration  
3. Multiple recruitment methods                                                  |
Is MyChart Right for your Team/Project?

Some things to think about are:

1. Your target population
   - Are they in Epic? Run a report on TriNetX

2. Are they represented among MyChart Users?
   - Review the demographics of MyChart users

3. Can your eligibility criteria be identified within the EMR?
   - Keep in mind that certain data elements are more difficult/costly to query due to time requirements, such as:
     - flowsheet values (devices, lines/drains, vitals),
     - imaging results and pathology reports contained in semi-structured notes, and
     - socioeconomic indicators such as education level, median household income, homelessness, and whether or not the patients speak English fluently
   - Keep in mind that reports with fewer eligible patients will have a high cost per person

4. Are you using other recruitment methods in tandem to MyChart?

5. Do you have the staff members available to be attentive to inquiries following messages being sent?
The responsibilities of the Study Team when using MyChart for recruitment

- Contact RIU team with interest
- Complete checklist/screening form of study details and return to RIU team
- CCDA assesses feasibility
- Yes
  - RIU team seeks approval from MyChart council
- No
  - Team not eligible to send messaging out
  - Team develops messaging letter with RIU team for IRB approval
- Team submits CIR to IRB for approval to message inviations
- IRB approval
  - Yes
    - CCDA writes query and moves to Epic workbench report
  - No
    - RIU team sends messaging for team
- Study team receives contact from interested participants
Other Recruitment Tools

REDCap

REDCap is a secure web application for building and managing online surveys and databases.

Both surveys and databases can be built:

- By an online method from a web browser using the “Online Designer”
- By an offline method by constructing a ‘data dictionary’ template file in Microsoft Excel, which can be later uploaded into REDCap
- By a combination of the online and offline methods

Features:

- Automated export procedures for seamless data downloads to Excel and common statistical packages (SPSS, SAS, Stata, R)
- A built-in project calendar
- A scheduling module
- Ad hoc reporting tools
- Advanced features, such as branching logic, file uploading, and calculated fields.
1. Inbox notification that a study participant is in a Johns Hopkins ED or has been admitted as an inpatient at Johns Hopkins

2. SlicerDicer * for:
   i. Generating patient counts
   ii. Accessing identifiable data (only available for patients under an investigator’s care)

3. Epic reports to support research (the approval of the Epic Research Request Review Committee)

4. TriNetX *:
   i. Find patient counts for a study cohort
   ii. Run analysis tools to examine demographics, labs, meds, and diagnoses for a study cohort
   iii. Examine the effect that inclusion and exclusion criteria may have on narrowing a study cohort

* Denotes a self-service tool
Questions about this resource including information about current pricing for custom programming work can be directed to:

- Diana Gumas  
  Senior Director of Clinical Research IT  
  dgumas@jhmi.edu  
  410-614-7004

- Benjamin Smith  
  EPIC Application Lead (PACE)  
  bsmi159@jhmi.edu  
  410-234-9549

- Thomas Grader-Beck, MD  
  EPIC Clinical Lead (PACE)  
  tgb@jhmi.edu  
  410-550-2039
ICTR MyChart Recruitment Service
410-361-6467
Research_recruitment@jhmi.edu

Hailey Miller: hmille45@jhmi.edu
Cassie Lewis-Land: clewis4@jhmi.edu

https://ictr.johnshopkins.edu/programs_resources/programs-resources/research-participant-recruitment-and-retention/my-chartepic-based-recruitment/
**Key Definitions**

**Report Size:** total number of patients that were identified through the computable phenotype criteria as eligible for a given report.

**Batch Size:** total number of patients that are messaged each time messages are distributed.

**Response Rate:** total number of interested patients who inquired with the respective study team following receiving a message divided by the total number of patients who received a message for that respective study.

**Eligibility Rate:** total number of patients who qualified as eligible for the respective study after responding to a message divided by the total number of patients who received a message for that respective study.

**Enrollment Rate:** total number of patients that enrolled in the respective study after receiving a message divided by the total number of patients who received a message for that respective study.