Evaluation of a Secure Mobile and Clinical Communication Solution (SMaCCS) in Acute and Community Practice Settings on Vancouver Island

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Aim

Clinicians struggle to provide information to each other that will support safe patient transitions, especially across jurisdictions such as between acute and community care. They need flexible communication tools and strategies to improve care coordination. Island Health introduced a Secure Mobile and Clinical Communication Solution (SMaCCS) to address these challenges in 2018 amongst switchboard operators, pharmacists, and physicians.

This study evaluated the SMaCCS in order to understand:
1. Volume and complexity of healthcare communication using SMaCCS
2. Degree of adoption and acceptability of SMaCCS
3. Effects of using SMaCCS on workflow and care provision
4. User experiences with SMaCCS

Background

The delivery of patient-centered care requires an ability to collaborate and securely communicate across care settings and organizational boundaries, including hospitals and community care settings. Current modes of communication, such as pagers, fax, and telephone, are inadequate to the contemporary needs of clinicians, because they require laborious manual processes and scheduling alignment that is difficult to achieve. Smartphones are ubiquitous and have the potential to solve many of these problems. However, without a secure system available, care providers (including family physicians, specialists, hospitalists, nurses and pharmacists) may resort to using non-secure applications to communicate about patient care. Implementing a supported cross-continuum communication tool was necessary and required thorough evaluation.

Methods

SMaCCS Selection: Island Health IMIT selected "Vocera Collaborations Suite" as the secure messaging platform to be implemented for this project. Secure text messaging was the primary component utilized in this trial.

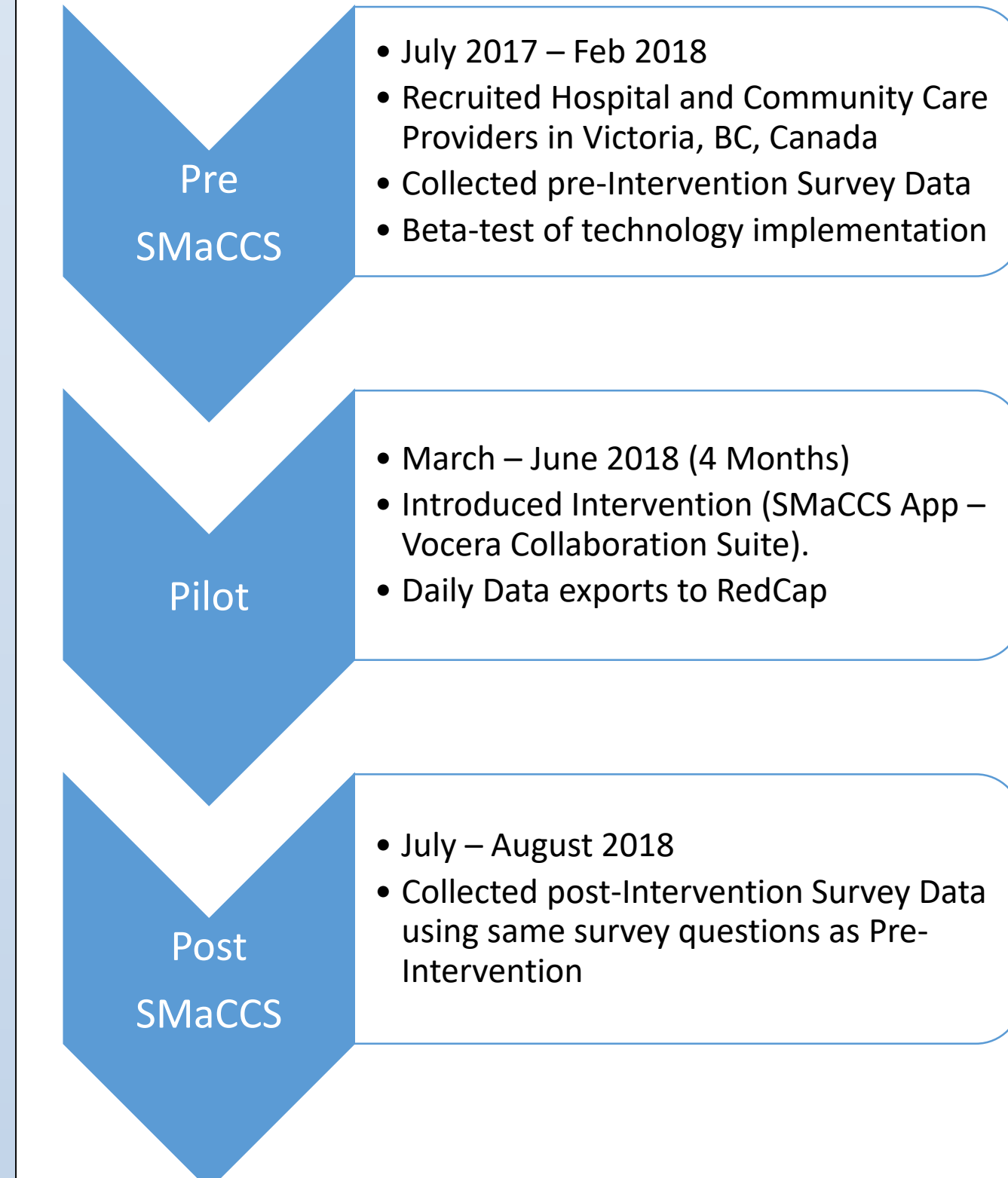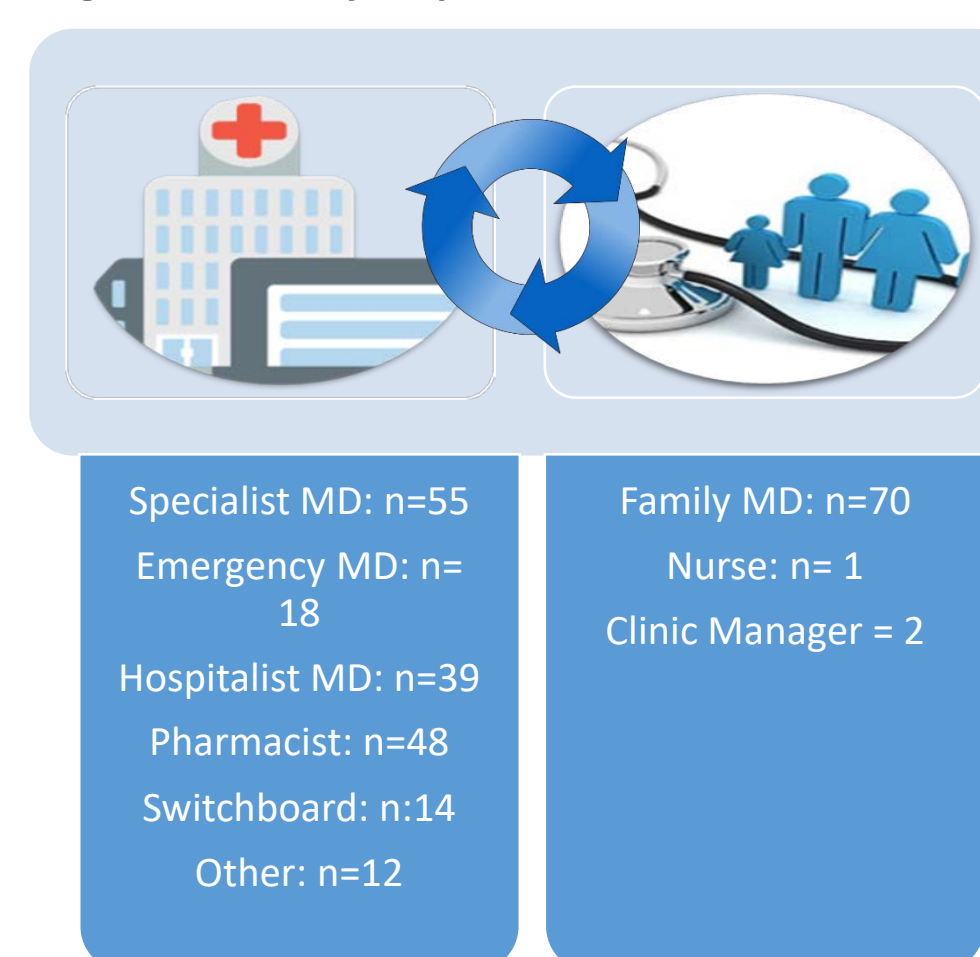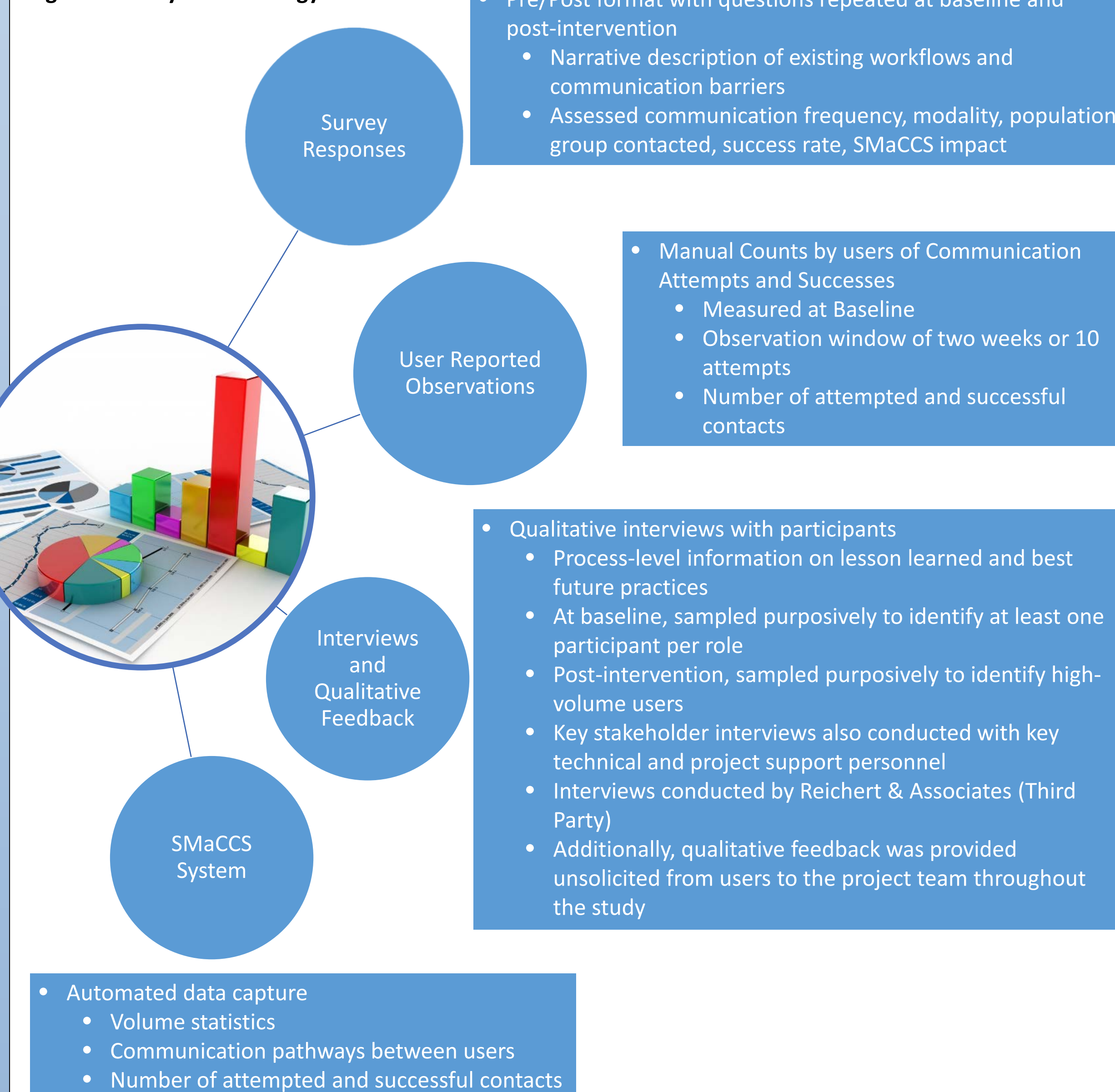**Timeline**

Figure 1: Timeline of SMaCCS trial

Pre SMaCCS
- July 2017 – Feb 2018
- Recruited Hospital and Community Care Providers in Victoria, BC, Canada
- Collected pre-Intervention Survey Data
- Beta-test of technology implementation

Pilot
- March – June 2018 (4 Months)
- Introduced Intervention (SMaCCS App – Vocera Collaboration Suite).
- Daily Data exports to RedCap

Post SMaCCS
- July – August 2018
- Collected post-Intervention Survey Data using same survey questions as Pre-Intervention

Figure 2: Study Population

Specialist MD: n=55
Emergency MD: n= 18
Hospitalist MD: n=39
Pharmacist: n=48
Switchboard: n:14
Other: n=12
Family MD: n=70
Nurse: n= 1
Clinic Manager = 2

Note: Island Health Hospital-Based Providers at VGH and RJH (Victoria BC, Canada) and Greater Victoria (BC, Canada) General Practitioners, nurses and clinic managers

Mixed Methods Approach

Figure 3: Study Methodology

Survey Responses
- Pre/Post format with questions repeated at baseline and post-intervention
  - Narrative description of existing workflows and communication barriers
  - Assessed communication frequency, modality, population group contacted, success rate, SMaCCS impact

User Reported Observations
- Manual Counts by users of Communication Attempts and Successes
  - Measured at Baseline
  - Observation window of two weeks or 10 attempts
  - Number of attempted and successful contacts

Interviews and Qualitative Feedback
- Qualitative interviews with participants
  - Process-level information on lesson learned and best future practices
  - At baseline, sampled purposely to identify at least one participant per role
  - Post-intervention, sampled purposely to identify high-volume users
  - Key stakeholder interviews also conducted with key technical and project support personnel
  - Interviews conducted by Reichert & Associates (Third Party)
  - Additionally, qualitative feedback was provided unsolicited from users to the project team throughout the study

SMaCCS System
- Automated data capture
  - Volume statistics
  - Communication pathways between users
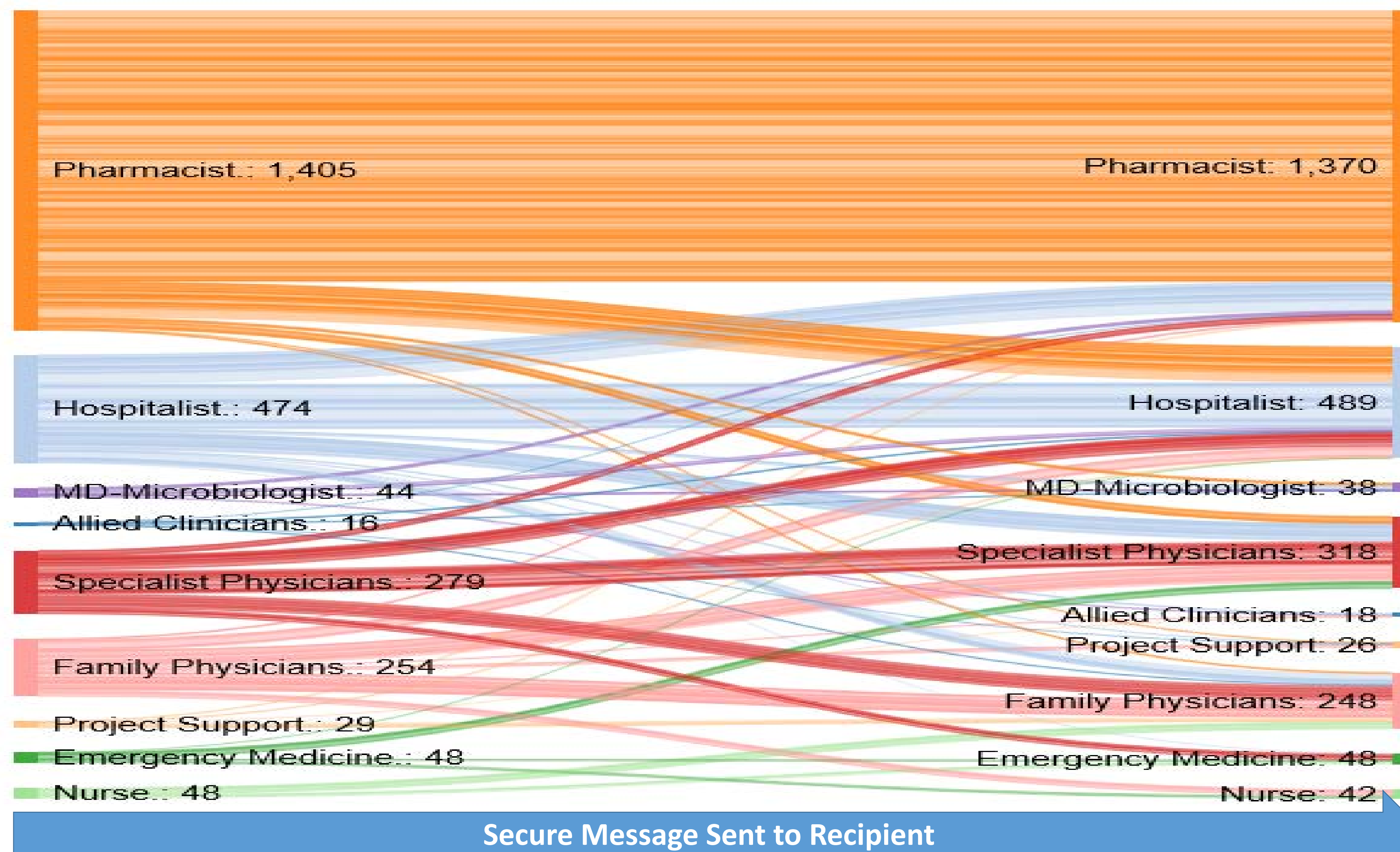 - Number of attempted and successful contacts

Data Management
Delivered SMaCCS data was archived nightly, removed from user devices, by being exported into a VIHA RedCap Data Store. Exported data was de-identified and replaced with unique identifiers. Undelivered messages were kept for a maximum of 5 days before being archived. Images were purged within 7 days.

Results

Figure 4: SanKey Diagram of Communication Pathways. Each line represents one message being sent

Pharmacist.: 1,405 → Pharmacist.: 1,370
Hospitalist.: 474 → Hospitalist.: 489
MD-Microbiologist.: 44 → MD-Microbiologist.: 38
Allied Clinicians.: 16 → Specialist Physicians.: 318
Specialist Physicians.: 279 → Allied Clinicians.: 18
Family Physicians.: 254 → Project Support.: 26
Project Support.: 29 → Family Physicians.: 248
Emergency Medicine.: 48 → Emergency Medicine.: 48
Nurse.: 48 → Nurse.: 42

Secure Message Sent to Recipient

Note: SanKey Diagram detailing communication paths between Originator (left side) and Receiver (right side). Participants grouped into nine categories: Pharmacists, Hospitalists (General Hospitalist, Psychiatric Hospitalist), MD Microbiologist, Allied Clinicians (Clinical Managers, Hospitalist Coordinators), Specialist Physicians (Orthopedic Surgery, Respirology, Internal Medicine, Radiology Oncology, Radiology, Rehabilitation, Medical Oncology, Geriatrics, Plastic Surgery, Pediatrics), Family Physicians, Project Support, Emergency Medicine, and Nurses

Figure 5: Interview Feedback

"For one case, I used it to clarify a narcotic order. The doctor was in the ER so I couldn't talk to her directly. Instead, I texted the patient name with the suggested increase dose and she called it in right away. This saved hours of waiting for clarification of pain control for this patient."

"I had a question for the specialist my patient was seeing so I sent a message and he responded quickly with the advice I needed. Normally, I would have had to fax him which would have resulted in a delay of a day. With the app, I got the answer in 5 minutes. There was no delay in patient care."

"One evening I received a text from the hospitalist about a patient of mine he was admitting. She was a complicated patient, a poor historian, with a complex social situation. Very quickly I was able to give collateral information which was used to help immediate patient care as well as with discharge planning. It took very little of my time but was very valuable to my patient and to the hospitalist."

"She [MOA] does most of the communicating with the outside world on my behalf. I am somewhat reluctant to receive clinical phone calls on my smartphone as I do not carry it with me all the time. I prefer contact initiated to me to go through my MOA.

Figure 6: Messages Sent using SMaCCS by Day of the Week

Figure 7: Proportion of Messages Sent and Received during SMaCCS Trial

Messages Sent: 1,592
Not Responded To: 378 (12%)
Messages Responded To: 1,214 (88%)

Figure 8: Challenges Identified with the SMaCCS (n=111)

Messages not returned — 8.8%
Had to charge phone at work — 10.7%
Others not available when I am — 10.7%
Lack of ability to turn off the app or indicated unavailability — 11.6%
Not easy to locate individuals in the directory — 12.5%
Drained Battery — 16.2%
Always feel like I am working when receiving messages on my smartphone — 17.7%

Figure 9: Response "Using the SMaCCS App allowed me to provide better clinical care to my patients" (n=111)

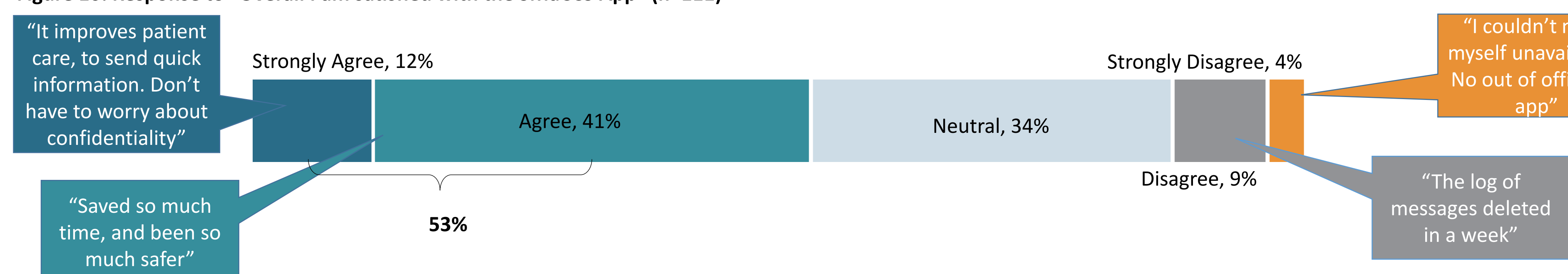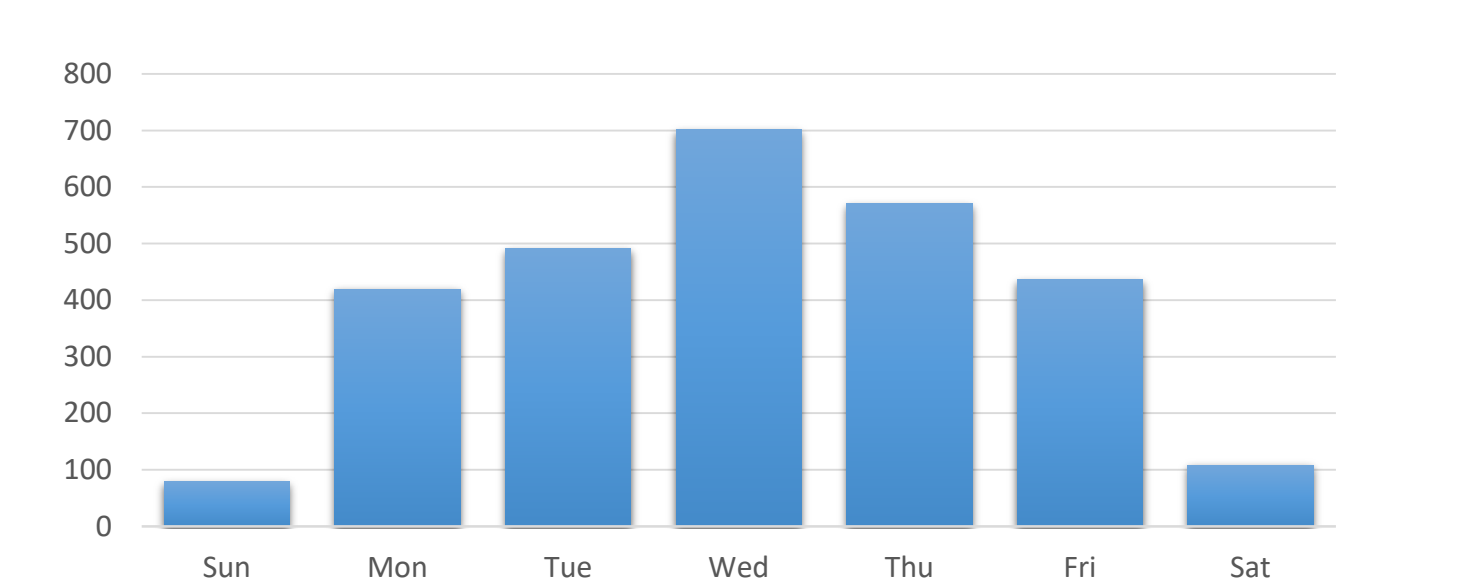"increase connectivity and I think that it bridges gaps with the GPs in particular."

"Helped me communicate with the GP better"

Strongly Agree, 10%
Agree, 32%
Neutral, 41%
Disagree, 14%
Strongly Disagree, 4%
42%

"Some people were not on it. That was a barrier"

"I am not worried about privacy...I just want the old system"

Figure 10: Response to "Overall I am satisfied with the SMaCCS App" (n=111)

"It improves patient care, to send quick information. Don't have to worry about confidentiality"

"Saved so much time, and been so much safer"

Strongly Agree, 12%
Agree, 41%
Neutral, 34%
Disagree, 9%
Strongly Disagree, 4%
53%

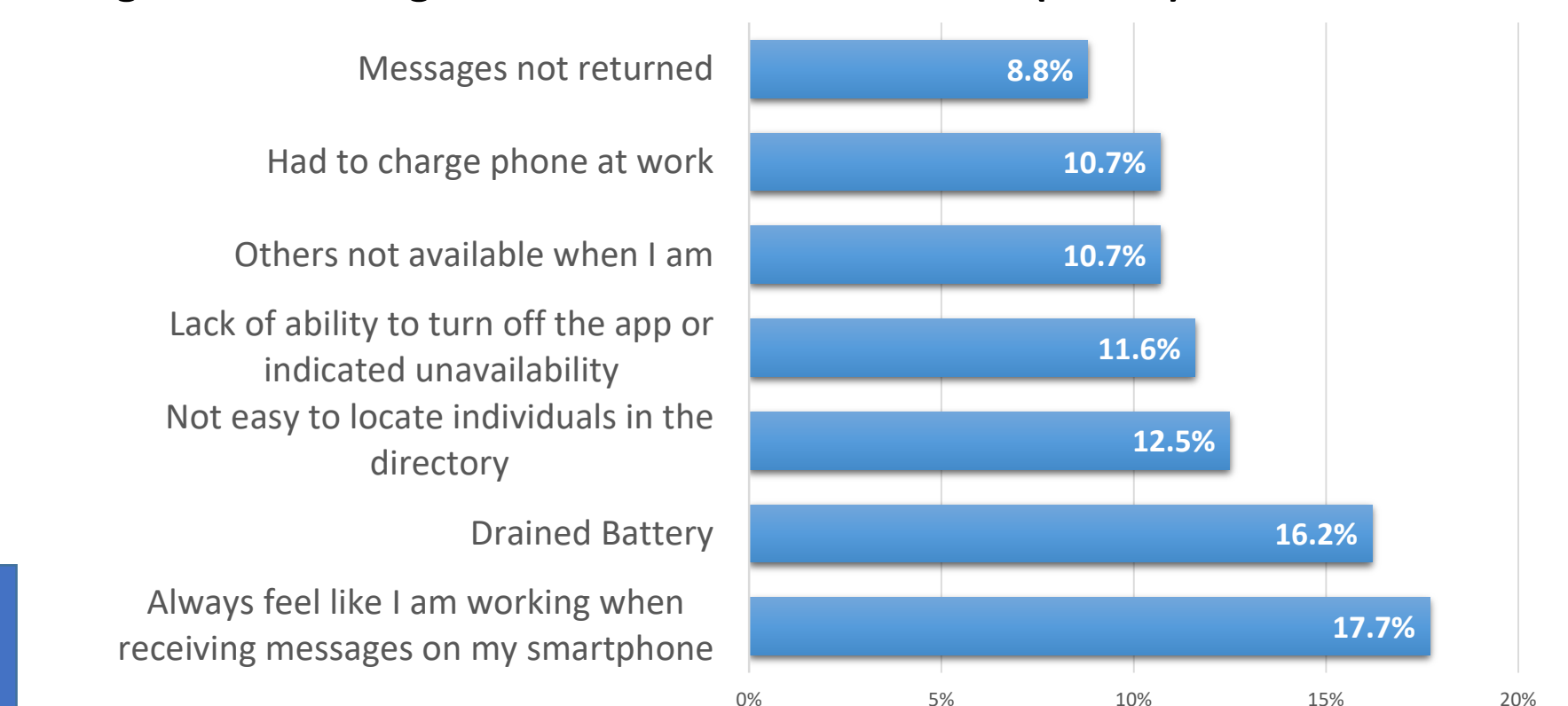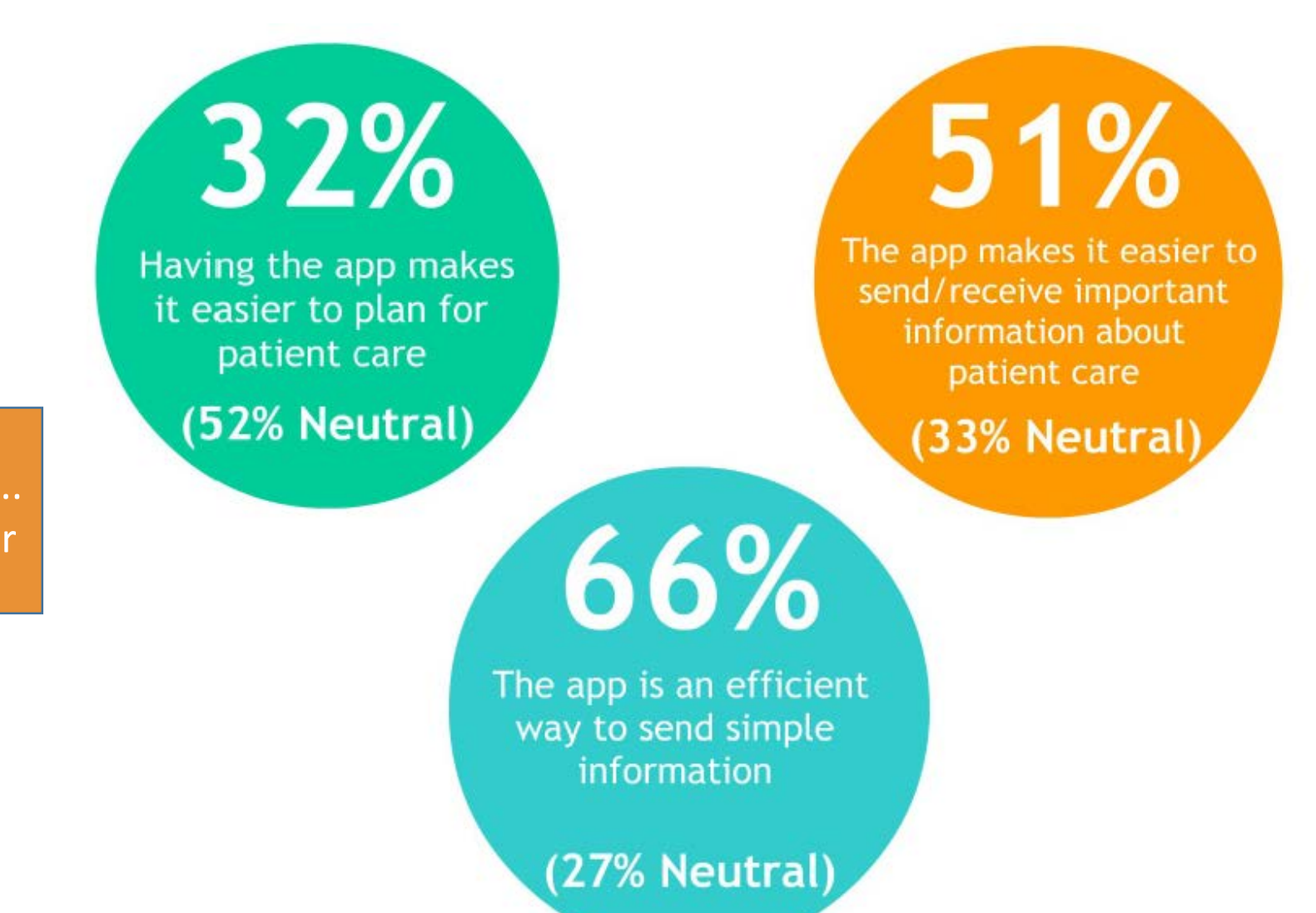"I couldn't make myself unavailable.. No out of office for app"

"The log of messages deleted in a week"

Figure 11: Potential to Improve Patient Care, % of participants who agree/strongly agree with the following (n=111)

32% Having the app makes it easier to plan for patient care (52% Neutral)

51% The app makes it easier to send/receive important information about patient care (33% Neutral)

66% The app is an efficient way to send simple information (27% Neutral)

Lessons Learned

- Cross continuum healthcare communication pathways are complex
- Some healthcare professionals value a secure way to communicate using text messages
- Some healthcare professionals value a communication tool used across the care continuum
- Healthcare professionals are willing to use own devices with the App
- If engaged, some healthcare professionals want to improve care models
- Tool must include as many potential clinical contacts as possible to be effective
- Technical learning curve for users is steeper than expected
- Workflow challenges persist (technology is not a panacea)
- Detailed workflows for switchboard use are required prior to further deployment
- Connection to the patient record would allow for further analysis of communication impact

Sustainability

- Initiative is aligned with provincial goals and objectives
- Initiative is aligned with provincial Innovation Acceleration Hubs
- Island Health Executive is supportive of this initiative

Next Steps for SMaCCS

- Focus next pilot evaluation on different members of healthcare team (eg. Community Health Services, community Pharmacy, Primary Care Networks)
- Refine implementation strategy based on identified barriers and enablers
- Determine workflows to allow switchboard operators to use SMaCCS
- Share findings with Island Health leadership, government and professional organizations.
- Contribute to provincial and regional conversations about technology enablers of care continuity and coordination
- Implement a communication platform which is linked to the patient record

Collaborative Organizations

THE UNIVERSITY OF BRITISH COLUMBIA — Faculty of Pharmaceutical Sciences

SharedCare — Partners for Patients

island health

Victoria Division of Family Practice — A GPSC initiative

South Island Division of Family Practice — A GPSC initiative

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References available on request