EU*US eHealth Work Project H2020-SC1-HCO13-2016

Mapping Skills and Competencies; Providing Access to Knowledge, Tools and Platforms; and Strengthening, Disseminating and Exploiting Success Outcomes for a Skilled Transatlantic eHealth Workforce

Sutter Health: Informatics Pioneers

Sutter Health Enterprise, California, United States

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 727552 EUUSEHEALTHWORK

TITLE Sutter Health: Informatics Pioneers

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ORGANIZATION
Sutter Health is a not-for-profit unified health care network providing comprehensive medical care in more than 100 Northern California cities and towns. Sutter has 53,000 employees and 12,000 physicians in their network, making them the 8th largest health system in the US. Truven Health Analytics™ named Sutter Health as one of the nation's top five largest health systems in 2016. Sutter Health and Sutter's Valley Area were named among the top-performing health systems in the country by Truven Health Analytics™ in its Top 15 Health Systems® study for achieving superior performance on five measures, including care, quality, patient satisfaction, cost per episode of illness and operational efficiency.

Annually, Sutter provides over 50 million moments of care and delivers 1% of all babies born in the US. Sutter Health has the single largest instance and largest server farm of any Epic Systems client. Sutter Health was voted most wired healthcare system in 2017 by the American Hospital Association (AHA) [1] and achieved for the Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM) Stage 7 in 2015 for both acute care and ambulatory.

BACKGROUND
In March of 1999, a single allergist in Davis, California became the first EpicCare user at Sutter Health. The first pilot at Palo Alto Medical Foundation (PAMF) began in June of 1999 at the Los Altos Center allowing "View Access" to see transcriptions and the physician's schedule. Physicians were encouraged to begin the process of abstracting paper charts into EpicCare including immunization dates, problem lists, as well as past medical, surgical and family histories. Over the next few months, test results would show up through a new interface with our lab information system, Sunquest, and eventually pathology reports. The success of the Los Altos pilot, lead to "View Access" for every PAMF physician in December of 1999, and was soon followed with physicians gaining the ability to enter orders, use smart sets, fax prescriptions directly to pharmacies (a huge patient satisfier) and place routine, future and standing orders. Over time, Sutter partnered with Epic to implement their new health maintenance and other decision support functionality.

Our informatics journey continued with the acute care implementation of our Sutter electronic health record (EHR) in 2007/2008. Each hospital was relatively autonomous, and variations in operations were prevalent. The EHR implementation was led by our Information Services (IS) division, who gathered over one hundred operational and clinical stakeholders in 2007 to help design the EHR. For a number of days, stakeholders convened in large hotel conference rooms and were asked to make EHR design decisions. We had no idea that this would be a journey, and not a one-time discrete event. This approach was likened to asking a person who has never seen water to build a bridge.

STATUS/CURRENT DEVELOPMENTS

Large variations exist within Sutter Health regarding our current state. Sutter Health is made up of 24 acute care hospitals throughout Northern California in the United States (US). Epic is the technology platform used across the enterprise for our EHR. Each of the 24 hospitals use the same single instance of Epic, meaning that every change implemented affects every EHR user across Sutter Health. Currently, education materials related to EHR changes are developed at the system level by the IS Learning and Transformation team. All education materials are housed on Microsoft's SharePoint Wiki platform and are accessible through facility intranet access. Materials are not accessible by users outside the Sutter Health network nor on mobile devices. The Learning and Transformation team provide standardized EHR education for on-boarding of all new employees that is provided virtually at most, but not all, hospitals.

Each facility takes responsibility for educating EHR users for all upcoming changes. A system notice outlining upcoming EHR changes for both inpatient and ambulatory is distributed via email to all users every two weeks. Data from hospitals has shown that many EHR users do not read the system notices, which increases variation in communication and continues to be problematic within hospitals.

A number of Sutter facilities have implemented a super user program that is supported financially by operations, in order to facilitate communication and training of other staff within their hospital. Some of these hospitals have a robust super user group and attend monthly or quarterly meetings to obtain information regarding all upcoming EHR changes. In these forums, staff are also expected to develop a communication plan that outlines how the new changes will be communicated to their peers. Data from these forums highlights the multiple communication modalities, like tip sheets, in order to communicate needed information to ensure that all staff are aware of changes occurring to the EHR that impact workflows.

Currently, nurses are also holding other positions while trying to carry out informatics duties. The deficiency of dedicated nursing informatics (NI) positions at all hospitals, along with missing infrastructure to support this, leads to lack of preparation and miscommunication for EHR upgrades or enhancements, furthering dissatisfaction among the staff.

Another platform that is inconsistently used for high impact workflow changes is Health Stream, an online healthcare learning management system that can be deployed system wide.

ACTIVITIES/MEASURES

For the purpose of this case study, and to understand the current state and perception of informatics within Sutter Health, we developed an online survey and deployed it to 150 registered nurses within the

system. The survey consisted of five questions, was deployed via Survey Monkey and yielded 76 respondents.

Respondent demographic information was not collected in the survey. Respondents (n=76) to the survey report that 84% are aware of the NI discipline (*Figure 1*). 73% of respondents define NI as focusing on how technology and data are implemented, adapted and used to improve patient care delivery, with a further 10% being unable to define NI (*Figure 2*). Of the respondents, 71% report seeking assistance from NI staff to troubleshoot problems, 29% to gather data for reports, 21% for help with technology, 60% to request changes in the EHR and 49% for assistance with education (*Figure 3*). In differentiating between an Information Analyst and a Nursing Informaticist, 33% reported having no idea, 29% that the roles are very similar and 25% that the roles are very different (*Figure 4*). When asked to describe how the NI program at Sutter Health could serve their needs, 32% responded that they would reach out for help with how to use the EHR more efficiently and effectively, 14% had no immediate idea and 10% wanted support for integrating new technology in patient care. Responses that were below 5% are not included.

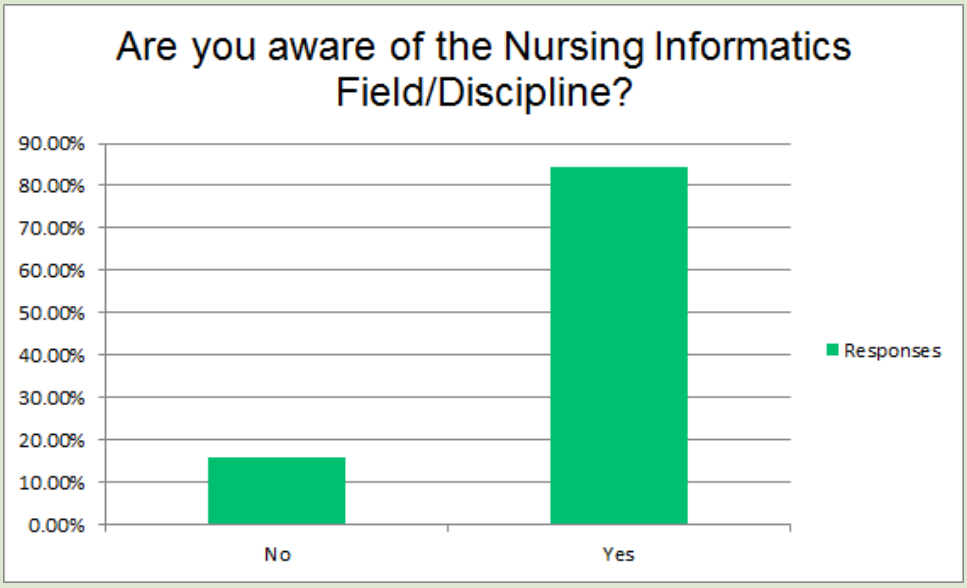

Figure 1: Are you aware of the Nursing Informatics Field/Discipline?

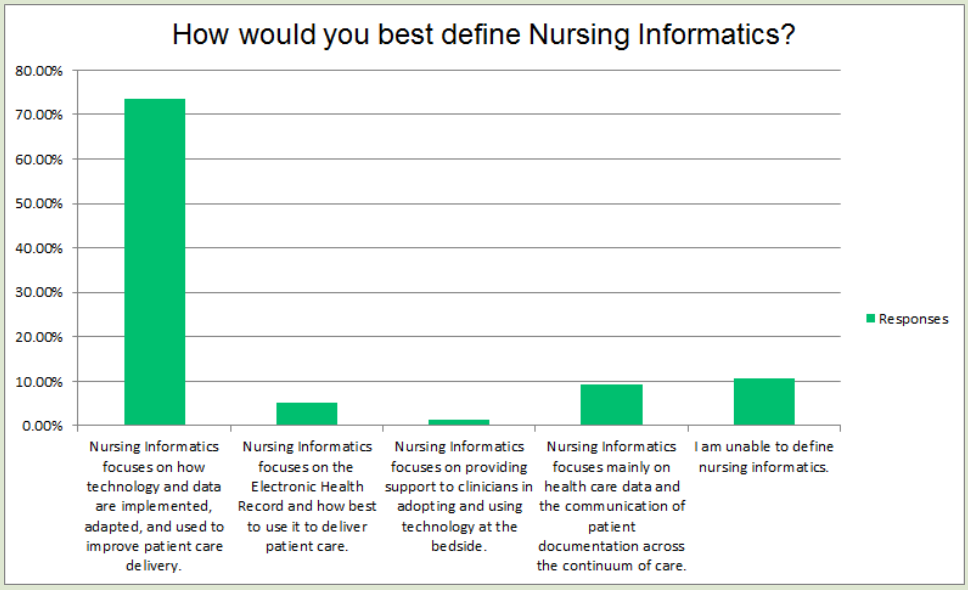

Figure 2: How would you best define Nursing Informatics?

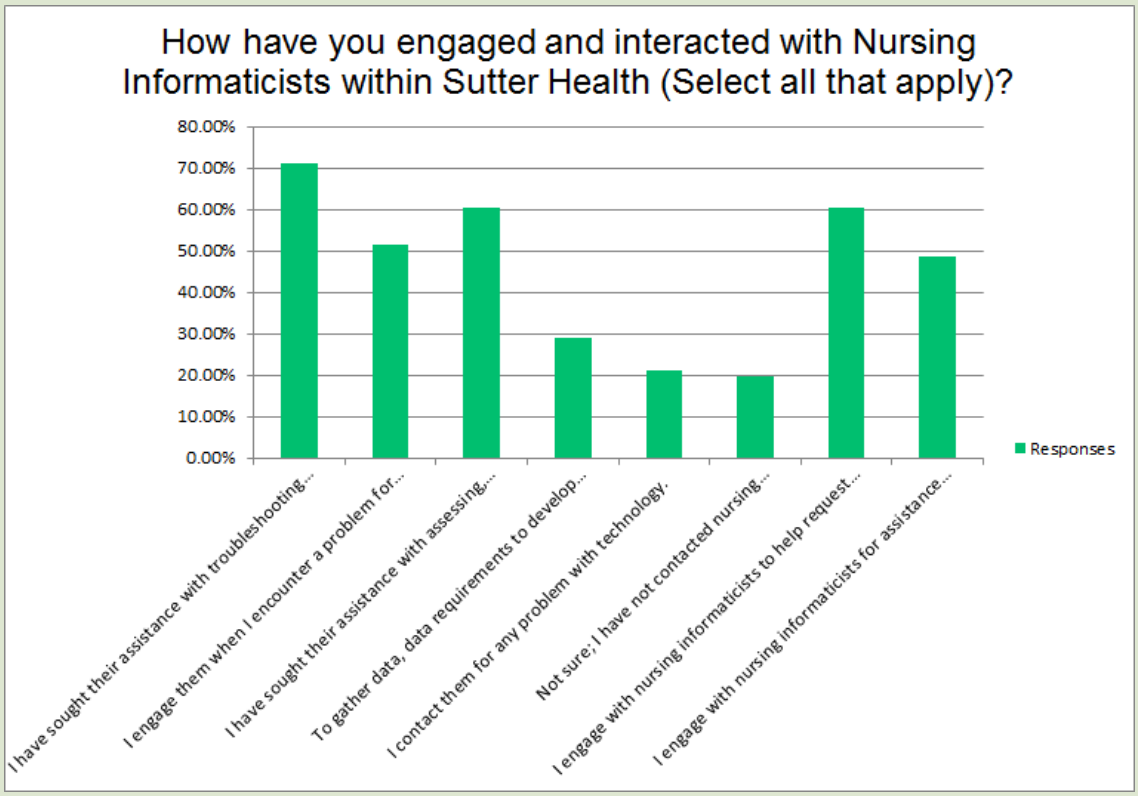

Figure 3: How have you engaged and interacted with Nursing Informaticists within Sutter Health?

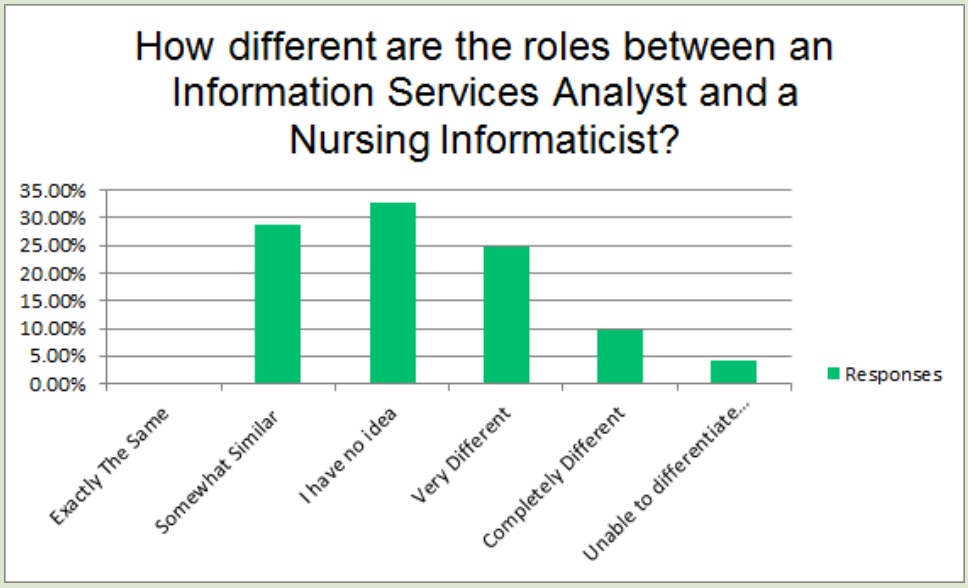

Figure 4: How different are the roles between an Information Service Analyst and a Nursing Informaticist?

CHANGES

As our organization continues on the path of developing a NI program, we have made numerous changes to enhance collaboration and clinical representation. These changes began with the designation of current staff nurses to represent their hospital at the Sutter Informatics Nursing Group (SING). SING started on the path towards the development of a NI program in our healthcare system by improving communication and collaboration across the 24 hospitals. Changes made at that time included: development of a formal governance structures for EHR changes, inclusion of informatics in various IS and clinical groups and improved partnerships with leaders throughout the organization. Initially, the shared governance required sharing information about the role of informatics within the organization. With this increased awareness, input from NI is beginning to be sought out by clinical leaders and by IS project teams. Nurse Informaticists are also becoming integral partners in the development, planning and implementation of technology initiatives across the organization. Informatics is becoming the voice for bedside nurses and ancillary staff for all implementation and optimization projects. SING has also begun to be used as internal EHR consultants for the hospitals we support. Informatics has been engaged in assessing current technology and asked for input on operational and workflow impacts on upcoming initiatives. Senior leadership has now identified the importance of NI in our organization, and in response, created a Chief Nursing Informatics Officer (CNIO) position. The decision to move forward and expand the NI presence was the result of a reorganizational assessment performed by a third-party consultant. The development of a NI Group, led by the CNIO, was part of the initial work. The new NI Group, under the direction of the CNIO, provides the platform needed in our on-going journey to develop a formal informatics structure and closes the gaps in informatics support.

Since our CNIO has joined the organization, we have made many changes to enhance our processes. NI representatives have been included in all EHR committees, partnered with the training team to provide training impact analysis and continue to represent nursing and ancillary clinicians for clinical upgrades to our lab information system and automated medication dispensing systems. As a result of these changes,

implementations, optimizations and EHR downtimes have occurred with less interruption to hospital operations. Patient safety has improved with increased reporting of identified issues and quicker resolutions. Clinicians have voiced that they feel their ideas and system enhancement suggestions are being heard. The NI team has been practicing all aspects of the American Nursing Informatics Associations (ANIA) Nursing Informatics standards of assessment, diagnosis, planning, implementation and evaluation. During a Process Improvement Report meeting, one of the hospital's Chief Executive Officer (CEO) commented that his Informaticist was a "super hero of sorts" within the organization. This attests to the value that NI is involved with all levels within the hospital setting, from CEO to bedside staff.

Compared to the beginning of our journey in the development of this specialized workforce, our NI program has made great strides and continues to improve over time. We are far from where we want to be, as we continue to strategize the best structure for our organizational culture, and we continue to face challenges with IS and IT re-organization. As an informatics team, we are driven to build a high reliable organization and are persevering to fill elusive communication gaps.

RESULTS

Because of the progress in program development, we were to conduct 2018 strategic planning as an enterprise team. We are in the process of developing business cases and, if approved, we will be leading several initiatives for the organization:

- Optimization for Care Plans, Documentation and Work list functionality
- Mobility solutions for nursing and ancillary services
- Implementation of a specialized program for Labor and Delivery functionality
- Vital Sign Monitor device integration

From a program perspective, the next steps to be considered are:

- Assess informatics reporting relationships
- Assess informatics roles and responsibilities
- Assess meeting structure and decision-making within the intake processes

OUTLOOK/LESSONS LEARNED

The Sutter Health Nursing Informatics Team has learned many lessons, and using the results of our survey, we plan to concentrate on some of the following key themes:

- Communication is critical, particularly in a large, complex organization such as Sutter Health. One Chief Operating Officer (COO) recently shared that it's almost impossible to over communicate. She asked that we communicate, with departments and staff, and then share updates until people ask us to stop.
- Communication should be two-way and closed loop (when the sender gives a message, the receiver repeats this back, then the sender confirms the message) to avoid misunderstandings. Forums need to exist for clinicians to provide input, ask questions and share insight. We are in the process of developing governance structures to support this.
- Often clinicians will ask for the solution without describing the business problem. It is critical for the Informaticist to take a step back and ask for the business problem to be described.

References

[1] Vesely R. Most Wired Hospitals and Health Systems Driving Efficiency, Improvement. Hospitals and Health Networks. 2017.https://www.hhnmag.com/articles/8391-most-wired-hospitals-and-health-system-driving-efficiency-improvement.

Case Study Checklists

Checklist of eHealth topics (competencies)	Apply? Yes/No	Describe how topic applies to your organization/case study
Role of "Peopleware": human factors, awareness, satisfaction and acceptance of health IT, usability measurements, evaluation of health IT, communication, leadership, change management, ethics and IT and similar topics	*Yes*	*Sutter Health is beginning to look at all aspects of user satisfaction in order to increase the value to patients.*
Role of inter-professional approaches: inter-professional versus mono-professional training and learning activities. What subjects lend themselves to inter-professional vs. mono-professional classes, learning environments and similar topics	*Yes*	*Sutter Health nurses were trained on the Interprofessional model for care plans.*
Role of healthcare data sciences: data and information acquisition including documentation, data quality, data, information and knowledge management, data analysis and statistics, clinical decision making instruments, reporting and similar topics	*Yes*	
Fusion of medical technology & informatics: software as a device, smart devices, automatic data acquisition via devices, risk and safety management	*No*	
Role of process and workflow management: clinical and administrative processes, information continuity and information logistics, management of processes, workflow management systems and similar topics	*Yes*	*We have much to improve on workflow for both nursing and physicians.*
Role of ethics, legal and data protection issues: ethics and IT, legal requirements, data protection	*No*	

and information self-determination, data safety and similar topics		
Role of learning and teaching: learning techniques ("learn how to learn"), learning and teaching styles (online, blended, face-to-face), learning management, information management for learning and teaching and similar topics	*Yes*	*Super user program, tip sheets, at the elbow support during launching of the EHR.*
Role of management related topics in health informatics and IT: principles of management, strategic management, stakeholder and change management, leadership, financial management, risk management, quality and safety management, resource planning and management and similar topics	*Yes*	*Future goals from the CNIO*
Role of technology: information and communication systems, telemedicine, telematics, assistive technologies, mHealth, life-cycle-management including systems development/engineering	*No*	
Role of consumers and populations: consumer health informatics, public health informatics	*No*	
Role of Research: information management in research, data analytics	*No*	
Role of interoperability: systems integration, IT standards, terminologies and classifications	*No*	

Checklist of eHealth topics (gaps and deficiencies)

Teaching the teachers: Are there any activities in your organisation to teach health IT/eHealth to teachers in healthcare?

We teach each other.

Supporting participatory design and acceptance testing/research: Are there any educational activities to teach or practice participatory design? Are their any activities including research in user acceptance testing and satisfaction measurement?

No

Integrating eHealth/health informatics into traditional curricula: Are there any activities to include eHealth/health informatics into traditional curricula of physicians, nurses and other health professionals with direct patient care?

Not yet, but Sutter Health is moving in that direction.

Motivating clinicians and managers: Are there any incentives and opportunities for clinicians and healthcare managers to acquire and update digital eHealth/health informatics skills and knowledge?

No

Engaging women: Are there any activities to attract female students in eHealth/health informatics or employ female health IT staff?

No

Adjusting job descriptions and enable continuing education: Are there any activities to adjust job descriptions, e.g., for clinicians, that include health informatics competencies (also proper use of health IT/eHealth systems) and are there activities to support staff updating and upgrading their health IT related skills and knowledge? This topic is mainly related to provider organisations and also to IT vendors.

The CNIO has organized an informatics boot camp to become certified in NI by the American Nursing Association (ANA).

Updating teaching and learning material: Are there any activities to ensure that the material is up-to-date and of high quality?

Sutter Health's Learning and Transformation Team works to deliver up-to-date training and education. They are also developing a virtual training environment for on-boarding of new staff, including ancillary positions that need informatics training in their job.

Availability of courses including electronic courses: Are there any additional activities to improve the availability of courses such as implementation of new courses, new course formats that recognise previous experiences/training in particular for continuing education?

Sutter Health has a virtual learning environment (VLE) for all roles, like nursing, physician, pharmacist, etc.

Informal caregivers: Are there any educational activities to teach health IT usage to informal caregivers, e.g. for assistive technologies?

No

Shortage of health informatics specialists: Are there any programmes to attract health informatics specialists?

No

eHealth Budget: Does your organization, area or region have a dedicated budget set aside for eHealth/health informatics training, education or workforce development initiatives?

No

eHealth Specialty Areas: Does your organization address any of these speciality settings/areas of training or outreach for eHealth education or workforce development: ambulatory care, social medicine, geriatric/ageing medicine, rehabilitation?

Yes