ABSTRACT: 2014 ELAM Institutional Action Project Poster Symposium

Project Title: Reinventing a Biomedical Informatics Program to Support Clinical and Translational Sciences in an Academic Medical Center

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Background, Challenge or Opportunity: The biomedical informatics program began as a core resource established with the funding of the NIH Clinical Translation Science Award (CTSA) to UIC to fund the new Center for Clinical and Translational Sciences (CCTS). The Biomedical Informatics (BI) Core was initially focused on clinical informatics, including establishing a clinical research data warehouse. Interest in genomics and personalized medicine efforts required bioinformatics resources and were emerging but lacked integration with the BI Core efforts. New resources committed by the Office of the Vice Chancellor for Research (OVCR) supported a new high performance computing cluster. In addition with a revised funding announcement for the NIH CTSA, the development and integration of both clinical and bioinformatics was encouraged, thus creating incentive for the University to accelerate this integrated development in order to be competitive for the next round of CTSA funding.

Purpose/Objectives: To reconsider the organization and resources needed to ensure establishment of a premier biomedical informatics program to support clinical and translational research at the University of Illinois at Chicago. Objectives include:
 (1) Reorganizing an emerging program into a sustainable organizational unit that will support research infrastructure across institutional boundaries.
(2) Planning strategic and financial aspects of a new program for an academic medical center.
(3) Building an infrastructure that is sufficiently agile yet effective in carrying out its mission and objectives.

Methods/Approach:
We worked with the leadership of the CCTS, Dean of the College of Medicine, the OVCR, and the Vice President for Health Affairs to ensure bioinformatics and clinical informatics is included in planned needs assessment and analysis. We have met and continue to discuss observations and plans with the CCTS and other leadership and key stakeholders, especially clinical and translational science faculty across the University. We are continuing to develop a new strategic plan and resource plan.

Outcomes and Evaluation Strategy:
Short term outcomes include progress on reassessing the program, developing a resource plan for a new Center for Research Informatics jointly supported by the CCTS, OVCR and the VPHA, and initial exploration on faculty needs through meetings with clinical and translational scientists.
Evaluation strategy will focus on continued progress over two years, including:
University leadership/stakeholders satisfied with new direction and program accomplishments in terms of extramural funding and services provided.
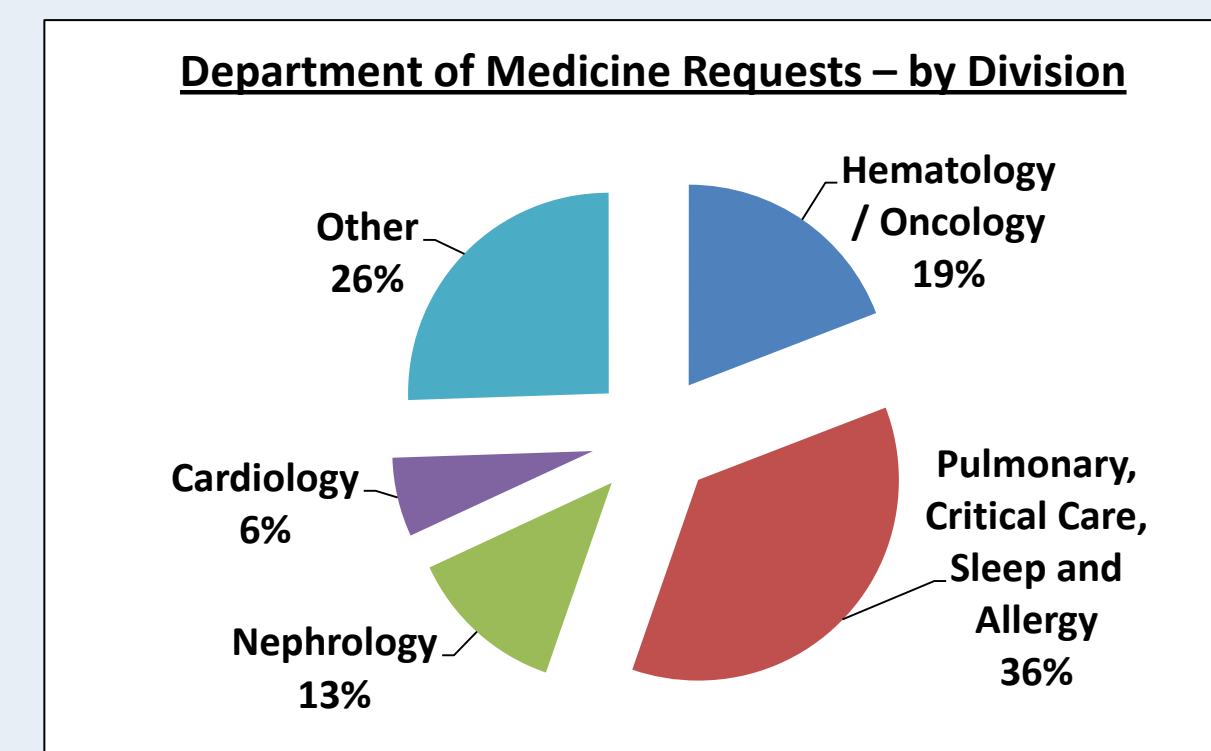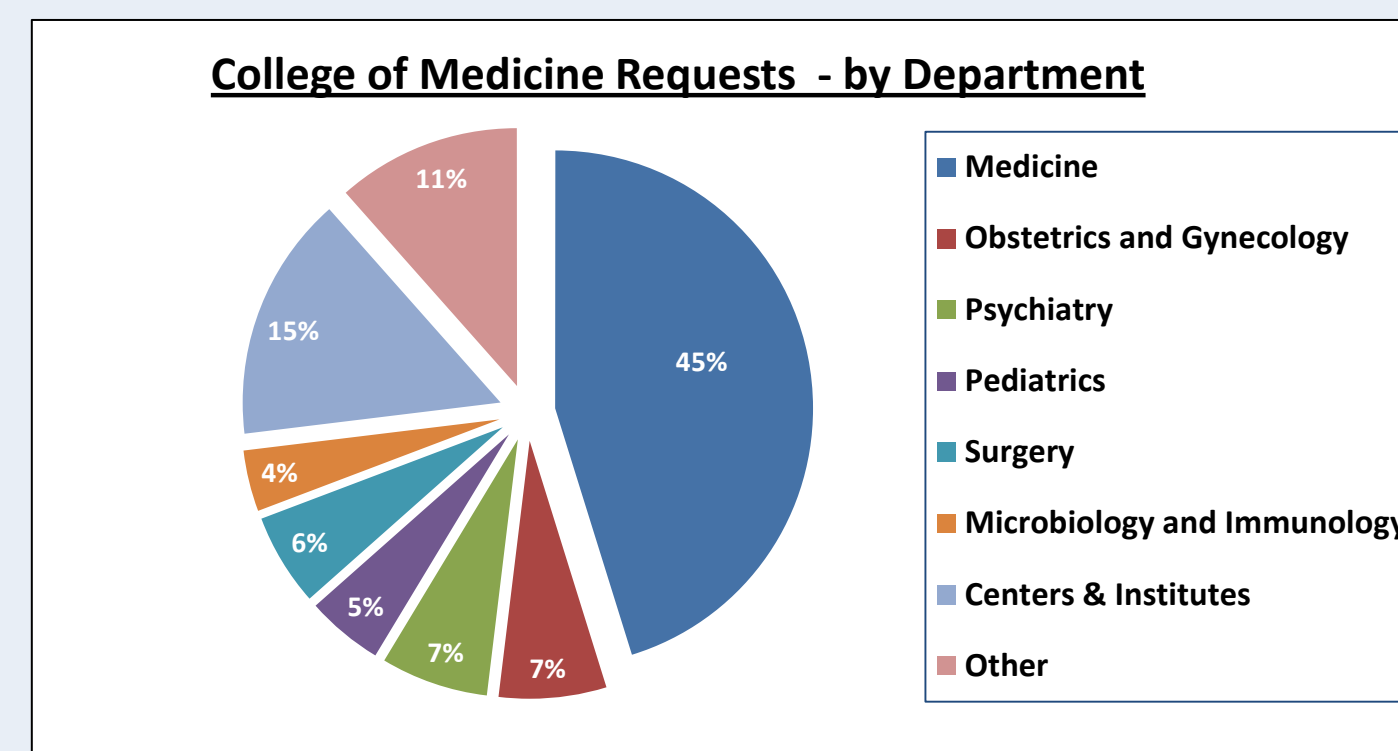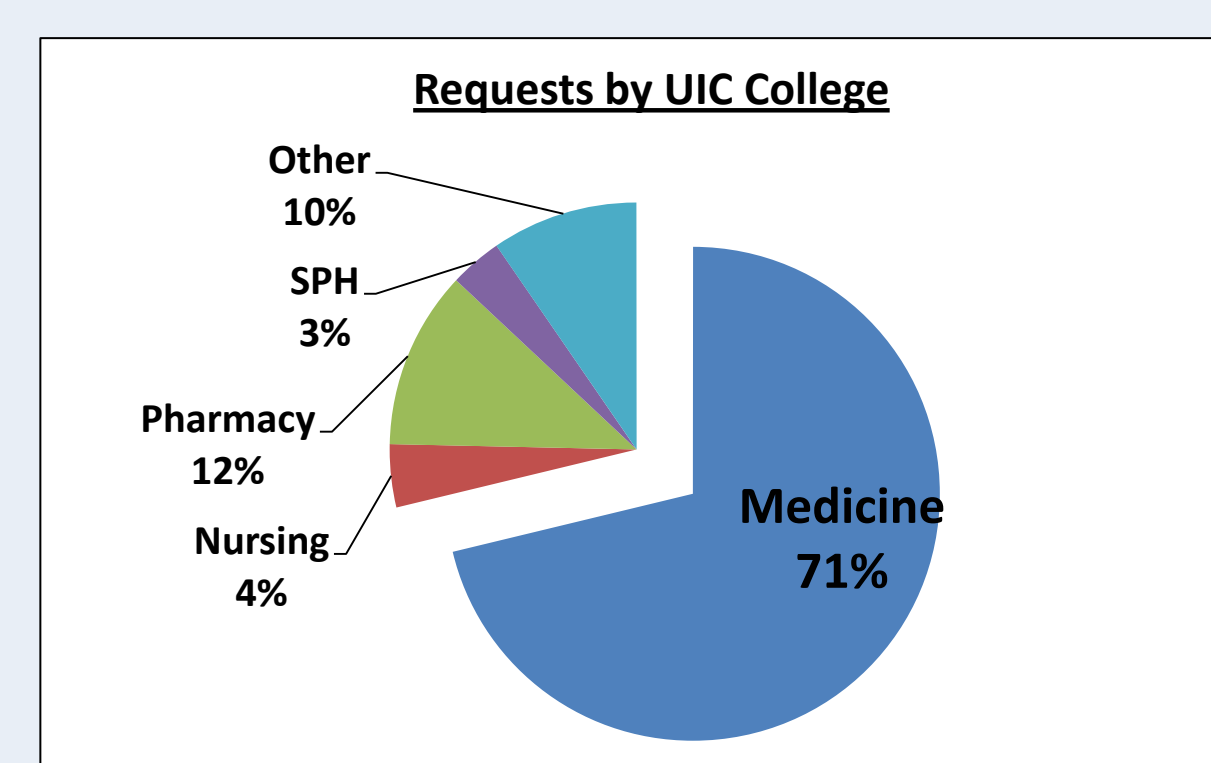Scientific Enhancement/Faculty recruitment: new informatics faculty recruited and hired.
Longer term outcomes include:
(1) Ability to leverage the program to support new informatics related extramurally funded programs.
(2) Ability to attract mid-career informatics scientist to collaborate and enhance the program.
(3) Ability to support a learning health system environment that considers the data knowledge and integration developed in research as an asset to the process improvement environment of the academic medical center.

Reorganizing a Biomedical Informatics Program to Support Clinical and Translational Sciences in an Academic Medical Center

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Purpose & Objectives

To transform a biomedical informatics program to provide an *enterprise-wide informatics framework* to support clinical *and translational* research at the University of Illinois at Chicago.

Objectives include:
1) Reorganizing an emerging program into a sustainable organizational unit that will support research infrastructure across institutional boundaries.
2) Planning strategic and financial aspects of a new program.
3) Building an infrastructure that is sufficiently agile yet effective in carrying out its mission and objectives.

Background

- The biomedical informatics program began as a core resource established with the funding of the NIH Clinical Translation Science Award (CTSA) to UIC to fund the new Center for Clinical and Translational Sciences (CCTS) in 2009.
- Initial focus was on informatics infrastructure, clinical informatics resources, informatics consulting services, and clinical informatics educational resources.
- Clinical research data warehouse (CRDW) went live in 2011.
- CCTS efforts to establish a biorepository began in 2010.
- Simultaneous effort to expand resources for high performance computing for genomics began in 2012.
- Campus-wide discussions about needs for computing resources to support enhanced data security.

Pictured left: High Performance Computing Cluster deployed at University of Illinois at Chicago

Growing Demand for Informatics Services

Number of Requests by Type (Clinical, Bioinformatics, Biorepository, General) — by period: Mar-May 2012; Jun-Aug 2012; Sept-Nov 2012; Dec-Feb 2013; Mar-May 2013; June-Aug 2013; Sept-Nov 2013; Dec-Present 2014

Requests by UIC College
- Medicine 71%
- Other 10%
- SPH 3%
- Pharmacy 12%
- Nursing 4%

College of Medicine Requests - by Department
- Medicine 45%
- Obstetrics and Gynecology 7%
- Psychiatry 7%
- Pediatrics 5%
- Surgery 6%
- Microbiology and Immunology 4%
- Centers & Institutes 15%
- Other 11%

Department of Medicine Requests – by Division
- Hematology / Oncology 19%
- Pulmonary, Critical Care, Sleep and Allergy 36%
- Nephrology 13%
- Cardiology 6%
- Other 26%

SWOT Analysis

Strengths
- Biomedical Informatics Core developed and implemented a CRDW using *i2b2* to support cohort discovery
- Supported several new grant efforts using data from the CRDW
- Strengthened relationships between academic programs and the medical center
- Mature research data management system (i. e., REDCap)
- Established and enhanced a faculty profiling system, *UICollaboratory,* to support collaboration across UIC
- Established web-based Community-Based Research Map
- OVCR investment in HP cluster

Weaknesses
- Diverse needs expand across a broad range of clinical and bioinformatics
- More established investigators have managed their own needs or collaborated outside UIC
- Limited data to demonstrate measurable impact on advancing clinical and translational research
- Limited data to demonstrate increased collaboration across disciplines
- No single academic home for biomedical informatics

Biomedical Informatics Programs at UIC

Opportunities
- Increasing need and interest in bioinformatics and genomics
- Interest and growth of large multisite studies
- Major new NIH & PCORI informatics, data network and training opportunities
- Cancer center investment in ONCOR™ creates an opportunity to expand its use beyond cancer studies

Threats
- Difficult for faculty to know what resources and services are available
- Currently lack faculty in bioinformatics with interest in clinical and translational sciences
- State budget constraints
- University and VPHA leadership transitions

Approach

- SWOT Analysis to frame strengths (S), weaknesses (W), opportunities (O), and threats (T)
- Discussions with key stakeholders in CCTS, Advisory Committee about SWOT components
- Develop strategic plan/resource plan for a new Center for Research Informatics jointly supported by the CCTS, OVCR and the VPHA
- Establish performance criteria and evaluation plans.
- Continued exploration of faculty needs through meetings with clinical and translational scientists.

Outcomes & Evaluation Strategy

Short term outcomes (Two Years):
1) Renewal of CCTS Program with strong informatics program.
2) University leadership/stakeholders satisfied with new direction and program accomplishments in terms of extramural funding and services provided.
3) Scientific enhancement/Faculty recruitment: new informatics faculty recruited and hired.
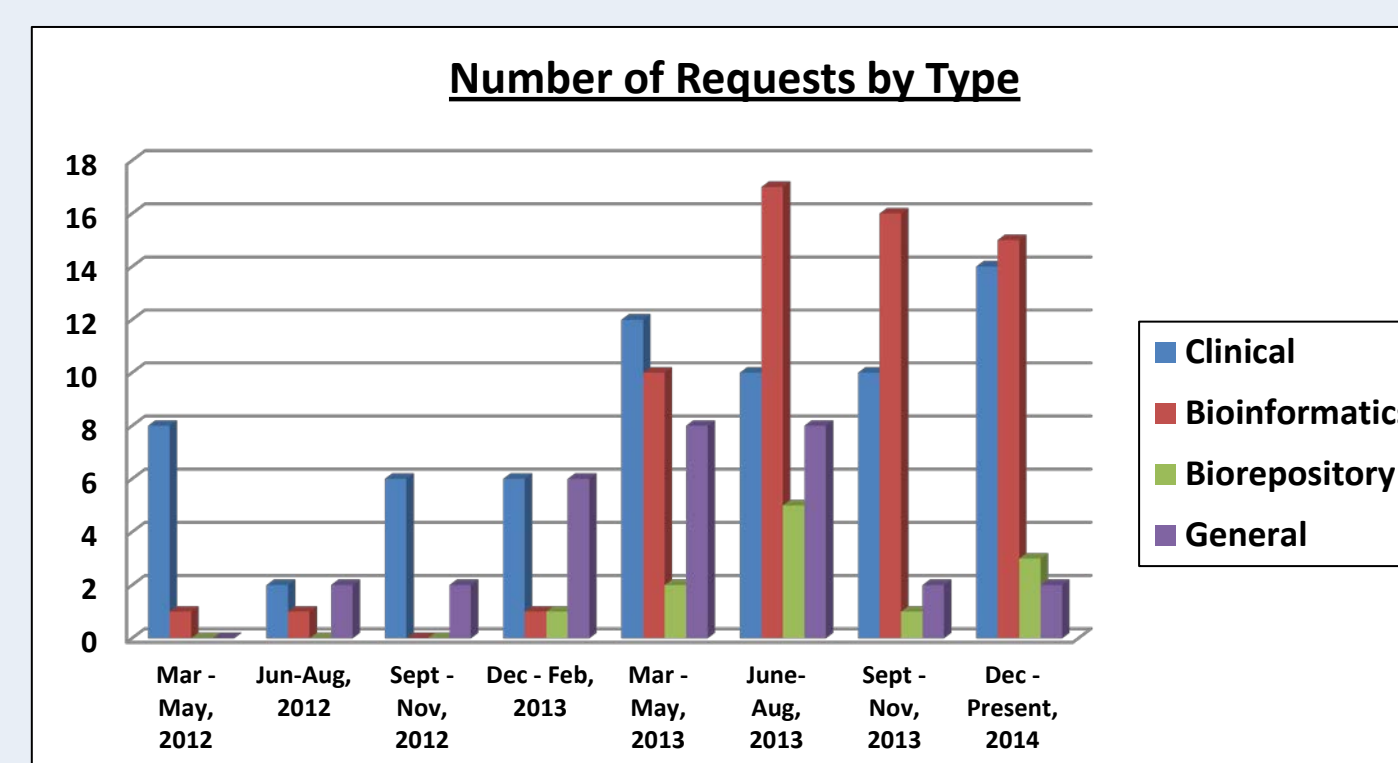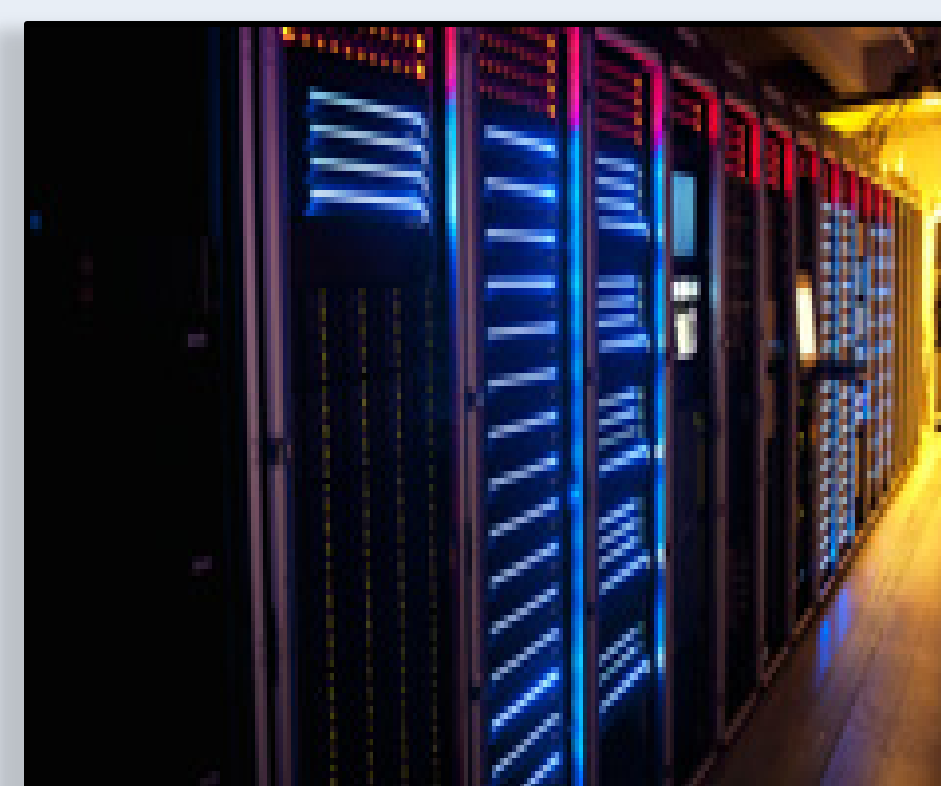
Longer term outcomes (Five Years):
1) Ability to leverage the program to support new informatics-related extramurally funded programs.
2) Ability to attract mid-career informatics scientist to collaborate and enhance the program.
3) Ability to support a learning health system environment that considers the data knowledge and integration developed in research as an asset to the process improvement environment of the academic medical center.

Conclusion & Next Steps

Continue to work through plans and meet with stakeholders to review progress toward goals. Revise plans/goals as needed.

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