Community Academic Partnership for a CA-MRSA Surveillance System in Community Health Centers: Early Results

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CDN — CLINICAL·DIRECTORS·NETWORK

Abstract

Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) infection among persons without recent exposure to a hospital/health care facility is defined as community-acquired MRSA (CA-MRSA). This project builds a research and learning collaborative for case-finding, biological specimen collection, clinical and laboratory testing and outcomes assessment among 6 NYC-area Community Health Centers (CHCs), Clinical Directors Network, and Rockefeller University Center for Clinical and Translational Science.

Methods

Six CHCs adjacent to a NYC Hospital HA-MRSA Surveillance Network are collaborating to prospectively: 1) enroll 129 patients with suspected CA-MRSA skin and soft tissue infections (SSTIs); 2) collect demographics, clinical history, physical examination, photo and quality of life data; 3) develop methods for clinical wound and nasal samples collection, preparation and transport to a clinical lab (for standard microbiologic culture/antibiotic sensitivity; BioReference) and a research lab (for whole genome analysis/ identification of genetic determinants of antimicrobial resistance; Dr. Tomasz's Lab).

Results

Based on the first 67 enrolled patients (52% of the recruitment goal), wound (34% MRSA+) and nasal specimens (18% MRSA+) were cultured and tested for antibiotic sensitivity, with 10% MRSA+ concordance. All CHCs are currently active in recruiting participants, and community-based clinicians and lab partners are engaged through team meetings and CME activities, and are now developing public health outreach activities.

Conclusion

This study demonstrates the feasibility of building a community-academic partnership to form the infrastructure for a CA-MRSA Surveillance Network. The results of this research will contribute to developing methods for evaluating CA-MRSA clinically and microbiologically, and will enable future comparative effectiveness research studies in community-based primary care settings.

Study Steps
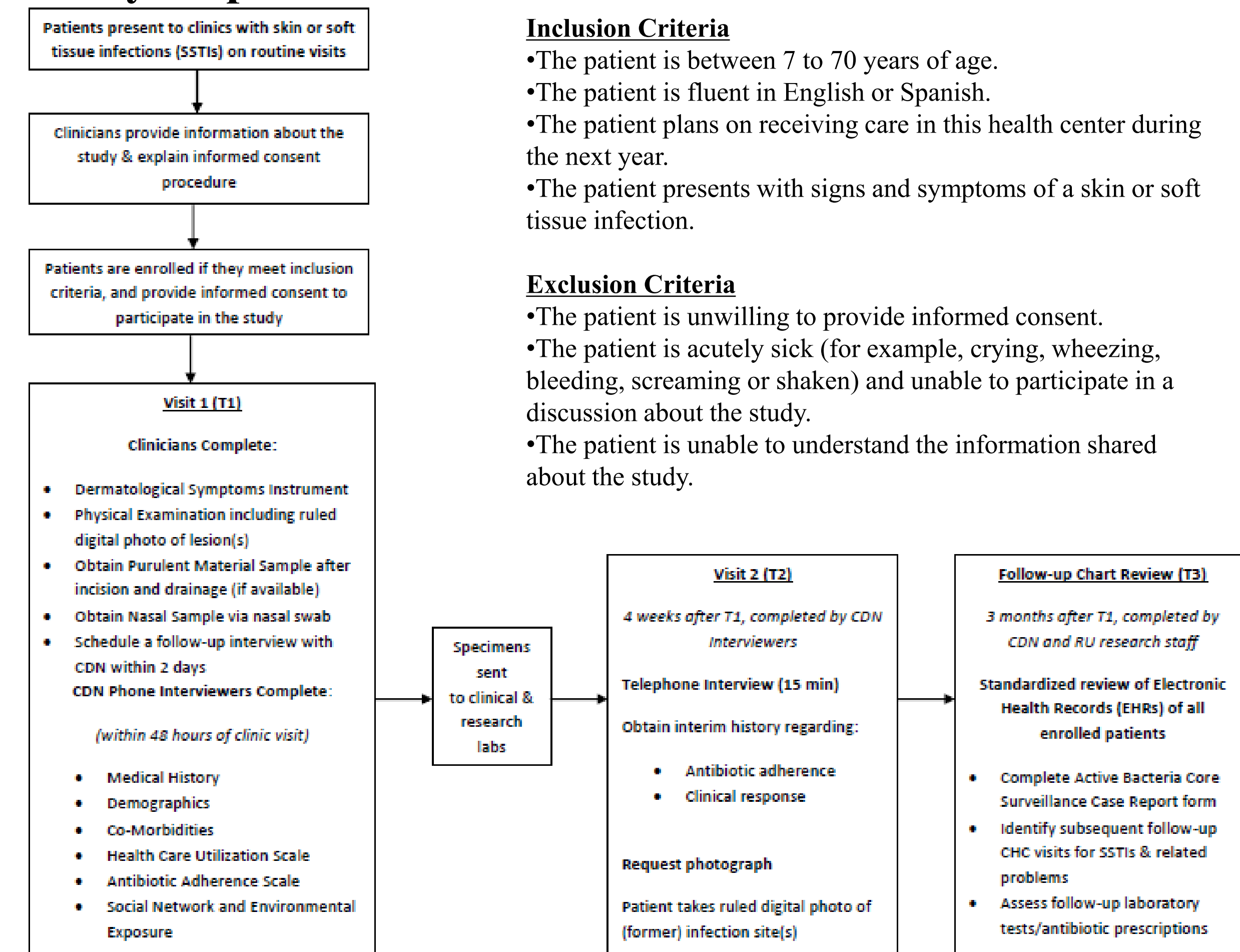
Inclusion Criteria
- The patient is between 7 to 70 years of age.
- The patient is fluent in English or Spanish.
- The patient plans on receiving care in this health center during the next year.
- The patient presents with signs and symptoms of a skin or soft tissue infection.

Exclusion Criteria
- The patient is unwilling to provide informed consent.
- The patient is acutely sick (for example, crying, wheezing, bleeding, screaming or shaken) and unable to participate in a discussion about the study.
- The patient is unable to understand the information shared about the study.
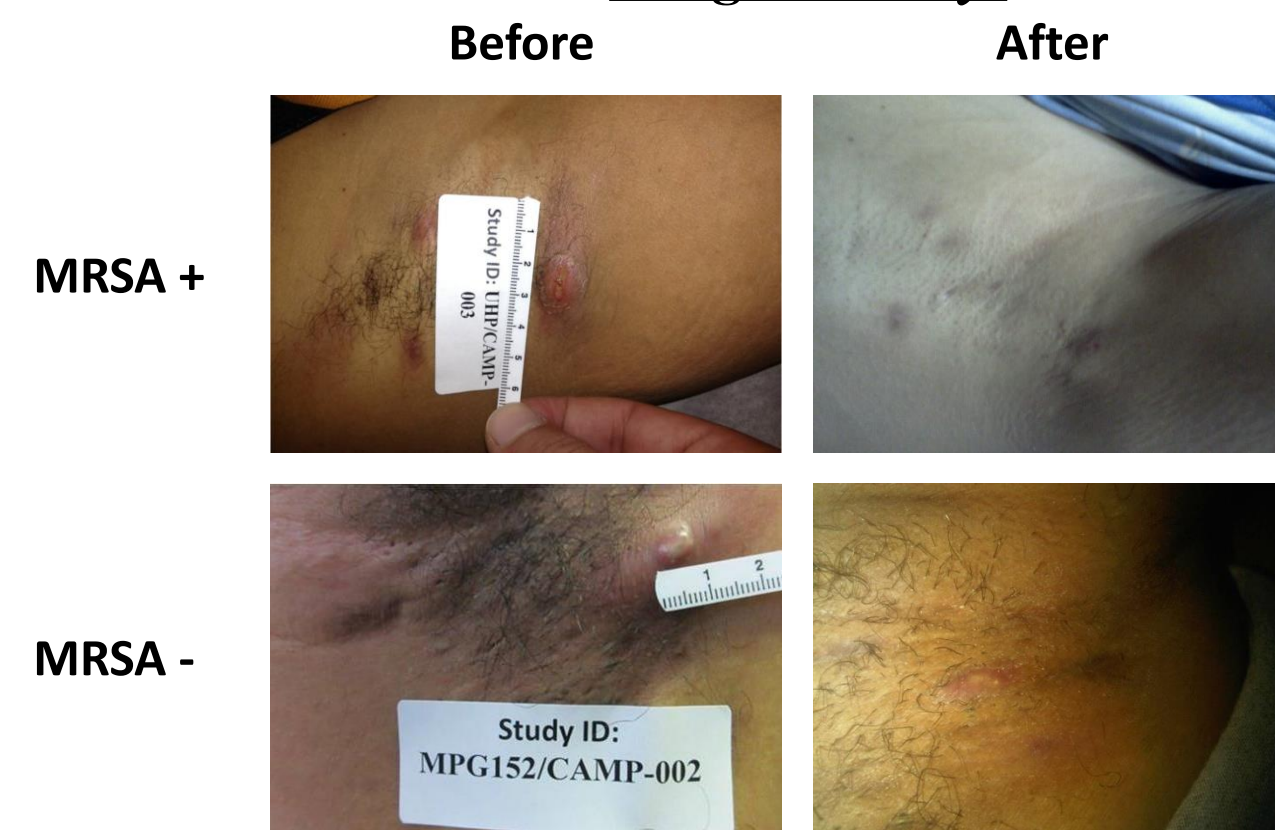
Study Instruments

Instrument	Source	# of Items
1.) Demographic Questionnaire	CDN	18
2.) Dermatologic Symptoms Instrument	CDC	4
3.) Screening Form/Case Report Form	DHHS & CDC	17
4.) Co-Morbidities Scale	CDC	29
5.) Health Care Utilization Scale	RAND Corporation	6
6.) Antibiotic Rx/Adherence Scale	CAPS, UCSF*	57
7.) Social Network Exposure	CDN	28
8.) Quality of Life Scale (SF12)	Medical Outcomes Trust	12
Total		171

Image Library

Before | After

MRSA +

MRSA –

Study ID: MPG152/CAMP-002

CA-MRSA Community Health Center Surveillance Network

Community Health Centers
Hospitals
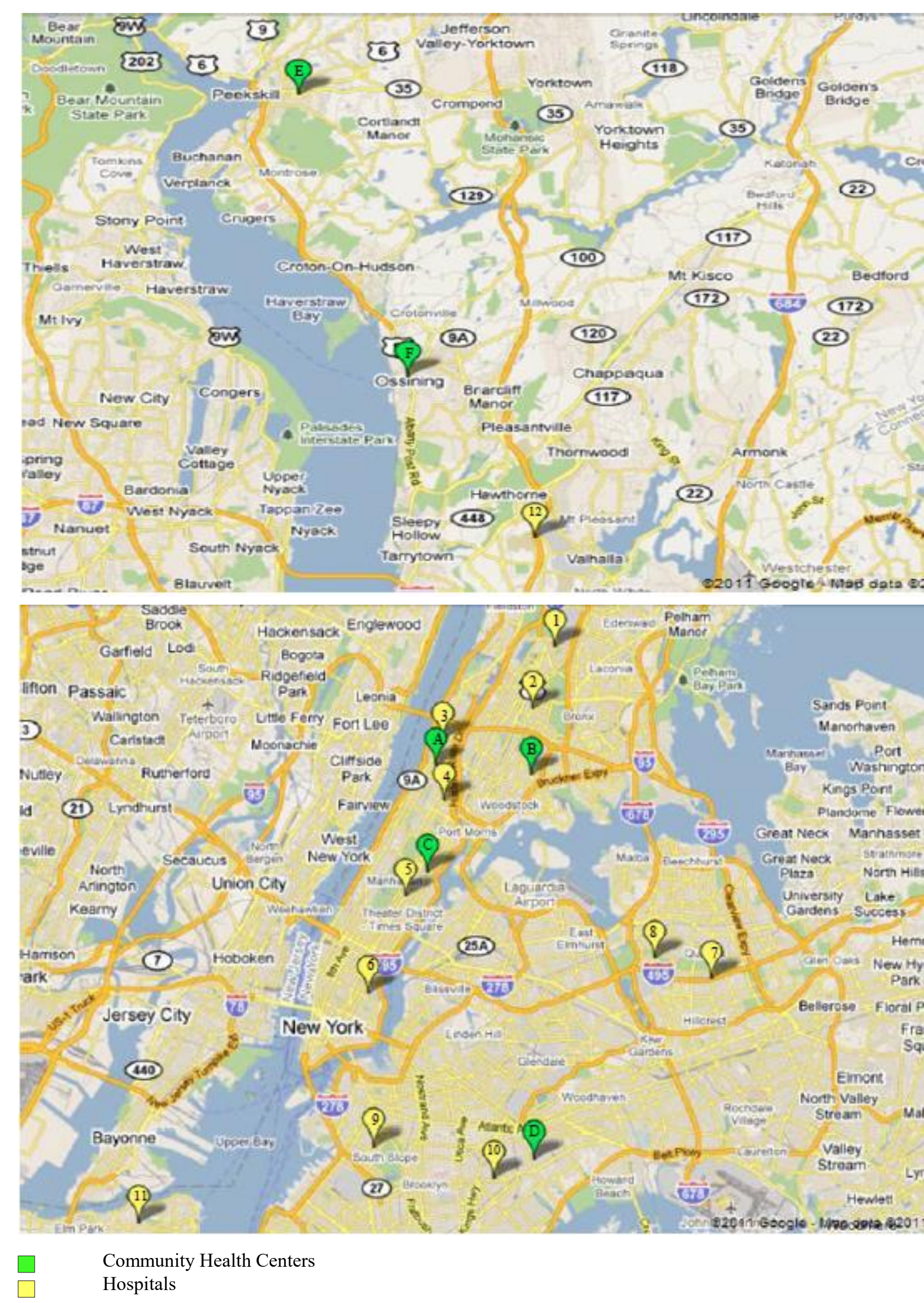
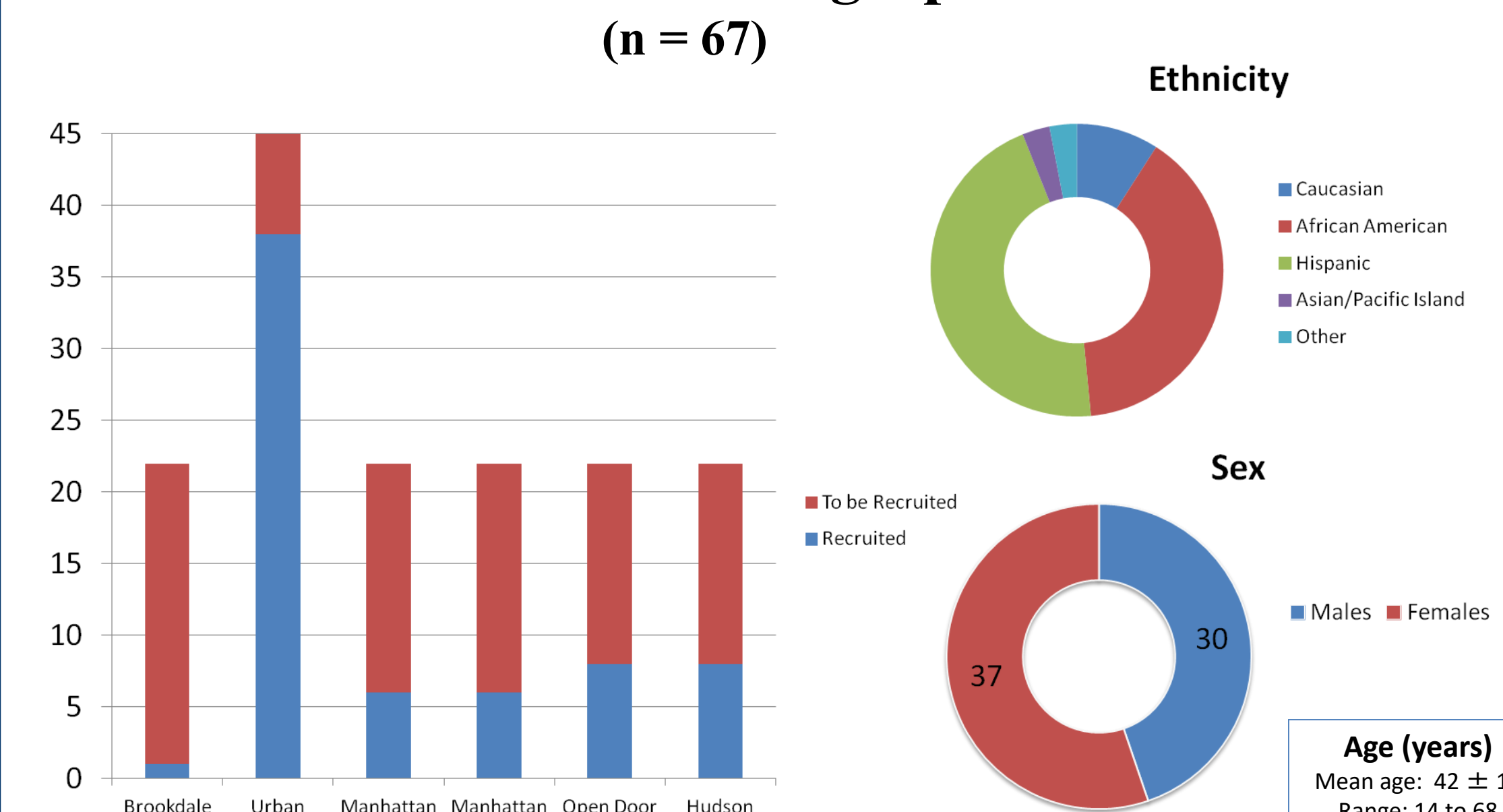| CHC Name	Location	Participating Clinicians
Brookdale Family Care Center	Brooklyn, NY	Fouzia Syed, MD; Hetal Tangal, MD; Natacha Yearwood, RN
Hudson River Health Care	Peekskill, NY	Carmen Chinea, MD; Christine Kerr, MD; Nancy Jenks, NP
Manhattan Physicians Group (95th St.)	Manhattan, NY	Matt Turner, NP; Jessina Carroll, NP; Melinda Sutton, MD; Judith Buck, NP
Manhattan Physicians Group (152nd St.)	Manhattan, NY	Jotir Ramnarine, MD; Rhonda Burgess, RN
Open Door Family Health Center	Ossining, NY	Daren Wu, MD; Onyinye Okpukpara, MD
Urban Health Plan	Bronx, NY	Shirish Balachandra, MD; Claude Parola, MD; Samuel De Leon, MD; Tracie Urban, NP; Sara Palomino, NP

CA-MRSA Project (CAMP) Rockefeller-CDN-CHC Team

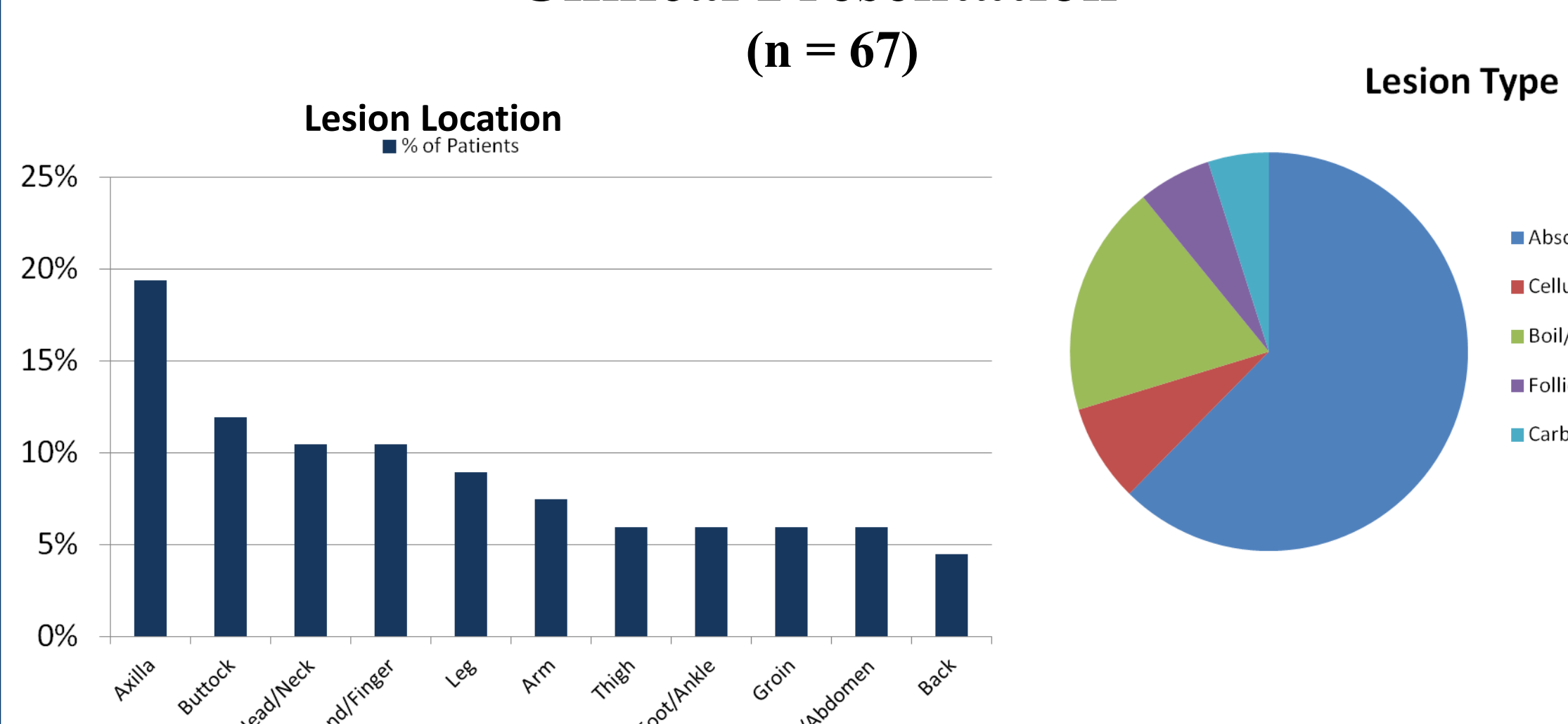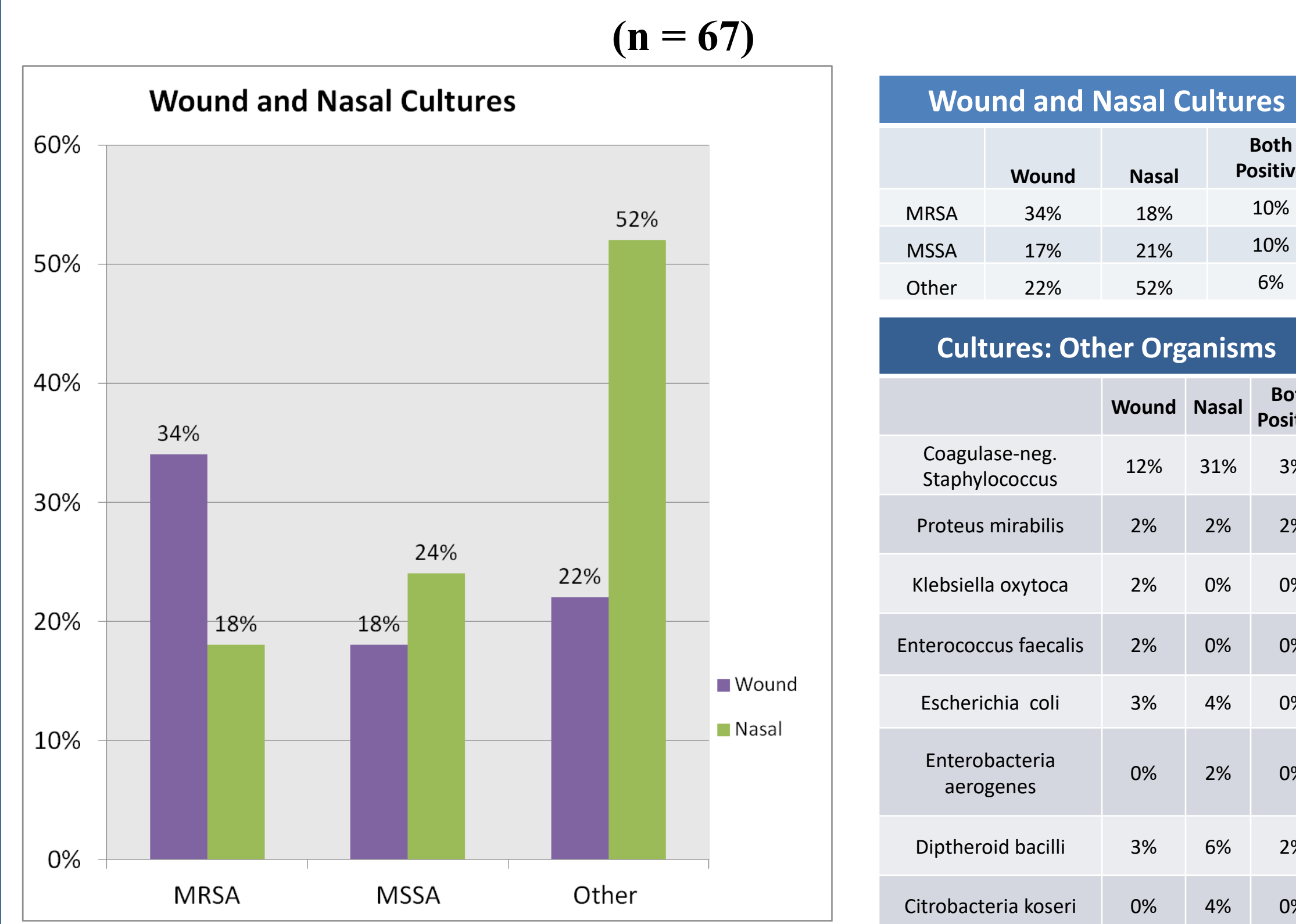*Bi-Directional Community Engaged Research Partnership*

Results

Recruitment Demographics (n = 67)

Ethnicity: Caucasian, African American, Hispanic, Asian/Pacific Island, Other

Sex: Males 30, Females 37

Age (years): Mean age: 42 ± 15; Range: 14 to 68

Clinical Presentation (n = 67)

Lesion Location (% of Patients): Axilla, Buttock, Head/Neck, Hand/Finger, Leg, Arm, Thigh, Foot/Ankle, Groin, Chest/Abdomen, Back

Lesion Type: Abscess, Cellulitis, Boil/Furuncle, Folliculitis, Carbuncle

Antibiotic Resistance in *S. aureus* isolates (n = 67)

Wound and Nasal Cultures — MRSA: Wound 34%, Nasal 18%; MSSA: Wound 18%, Nasal 24%; Other: Wound 22%, Nasal 52%

Wound and Nasal Cultures

	Wound	Nasal	Both Positive
MRSA	34%	18%	10%
MSSA	18%	21%	10%
Other	22%	52%	6%

Cultures: Other Organisms

	Wound	Nasal	Both Positive
Coagulase-neg. Staphylococcus	12%	31%	3%
Proteus mirabilis	2%	2%	0%
Klebsiella oxytoca	2%	0%	0%
Enterococcus faecalis	2%	0%	0%
Escherichia coli	3%	4%	0%
Enterobacteria aerogenes	2%	0%	0%
Diptheroid bacilli	3%	6%	2%
Citrobacteria koseri	0%	4%	0%

S. aureus Antibiotic Sensitivity (wound culture n = 35, nasal culture n = 28)

% Resistant (Wound); % Resistant (Nasal) — Amoxicillin, Cefazolin, Clindamycin, Erythromycin, Gentamicin, Levofloxacin, Linezolid, Methicillin, Oxacillin, Penicillin, Tetracycline, Trimethoprim-sulfa, Vancomycin

Results Continued

CA-MRSA in Primary Care: Practice Based Research Networks (PBRN) Studies

PBRN	CAMP[1]	STARNet[2]	IRENE[3]	DARTNet[4]	Total
States	New York	Texas	Iowa	Colorado, Texas, North Carolina	
N Practices	6	4	14	16	40
N Patients	67	119	216	316	683
CA-MRSA Rate	34%	67%	51%	66%*	55.5%
Other types of Staphylococcus	29%	13%	–	–	20.5%

*Out of S. aureus infections only

Infection Site	CAMP	STARNet	IRENE	DARTNet	Average (Mean)
Head/Neck	10%	7%	12%	-	10%
Groin/Lower Extremities	39%	33%	48%	-	40%
Thorax/Upper Extremities	51%	27%	40%	-	39%

Study Follow-Up Progress

% Completed — T1 Specimens Obtained 100%, T1 Photos Transmitted 100%, T1 Interviews Completed 87%, Specimens received at Rockefeller 85%, T2 Interviews Completed 78%, T2 Photos Transmitted 51%, T3 EHR Reviews Completed 0%
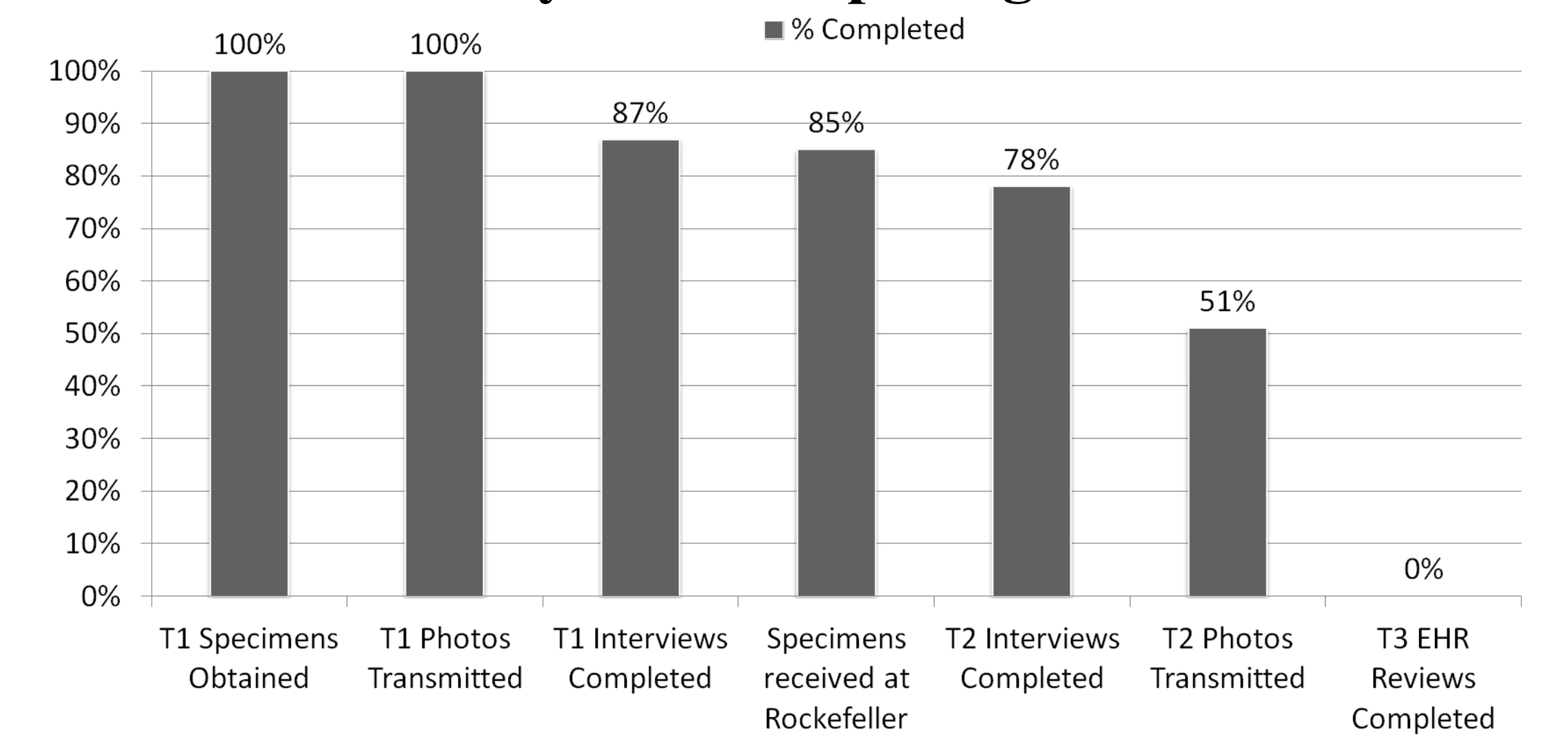
Conclusion & Next Steps

This study has demonstrated the feasibility of building a Community-Academic partnership to create the infrastructure for a CA-MRSA Surveillance Network.

Among patients presenting with SSTIs in participating CHCs, 34% of wound cultures were MRSA+, and 18% of wound cultures were MSSA+. Routine lab results showed that 26% of patients demonstrated concordance between wound and nasal swab cultures, with 10% of all patients showing concordant MRSA + cultures. Collectively, susceptibility tests for s. aureus, demonstrated resistance to multiple commonly used antibiotics. However, 100% of *s. aureus* isolates from wounds, including those resistant to methicillin (MRSA) remained susceptible to tetracycline, trimethoprim-sulfamethoxazole, vancomyacin, linezolid and gentamicin.

Comparing current CAMP results to other Primary Care PBRN studies, CA-MRSA rates in wound cultures appear to be lower in New York as compared to elsewhere. Whether this is a result of the relatively small sample size, or because of climate, seasonality, or differences in population demographics and/or risk factors requires further investigation. Future studies will examine the clinical, demographic, geographic, and microbiological correlates of CA-MRSA.

References

1. Tobin, JN. Clinical Directors Network and The Rockefeller University Center for Clinical and Translational Science. Establishing a Community-Associated Methicillin-Resistant *Staphylococcus Aureus* (CA-MRSA) Surveillance Network (2011- 2012).

2. Parchman, ML, Munoz A. Risk Factors for Methicillin-Resistant *Staphylococcus Aureus* Skin and Soft Tissue Infections Presenting in Primary Care: A South Texas Ambulatory Research Network (STARNet) Study. JABFM 2009; 22(4):375-379.

3. Daly JM, Levy BT, Ely JW, et al. Management of Skin and Soft Tissue Infections in Community Practice Before and After Implementing a "Best Practice" Approach: An Iowa Research Network (IRENE) Intervention Study. JABFM 2011; 24(5):524-533.

4. Bennett P, Fernald P, Coombs L, et al. Improving the Management of Skin and Soft Tissue Infections in Primary Care: A Report From State Networks of Colorado Ambulatory Practices and Partners (SNOCAP-USA) and the Distributed Ambulatory Research in Therapeutics Network (DARTNet). JABFM 2011; 24(5):534-542.

Funding