A Feasible Protocol for Addressing both HA-MRSA and CA-MRSA and similar resistant infectious diseases in public environments

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Abstract [draft]
This paper is intended to lay the groundwork for a protocol of preventive measures that can demonstrably reduce the spread of MRSA and similar resistant microbial infections within communities including centers predisposed to the spread of infectious diseases, such as hospitals, schools and other locations of frequent population interaction and contact. The fundamental protocol is based upon the evidence that community-acquired infectious diseases are rising as a significant health threat and supplanting hospital-acquired infections in the larger population. The methodology involves synchronized and consistently monitored preventive actions involving both long-term and relatively permanent surface bioprotection (not simply periodic treatment with disinfectants) and physical monitoring including the use of sensors (but not limited to specific target-of-interest pathogens such as MRSA). In addition, an essential part of the protocol, derived from classic chronic disease management strategies, incorporates a controlled and organized system of reinforcing personal and interpersonal hygienic practices that will provide effective barriers to contagion as well as expedient responsive treatment to identified occurrences. The key elements to the successful implementation of this protocol are in the methods employed for the surface bioprotection, the sensing and monitoring, and the informatics and communications, including education and reinforcement within targeted populations.

While this protocol remains to date (10/2007) untested in its comprehensive scope, its components are well-known and well-documented through use in a number of institutional settings, and the comprehensive protocol is ready for testing in a number of field environments. The aim of this paper is to generate awareness and dialogue from which will emerge a recognition of the value for conducting ongoing field tests and validations of this protocol in a variety of healthcare and non-healthcare institutions.

[comment:
In this draft of the paper, there are several outlined points. These will be completed as necessary for either publication or for use in proposal material in collaboration with others.]

Background
MRSA, HA-MRSA, CA-MRSA
[use material from NIAID, WCDM and Paris docs]

Prior Results
Aegis surface treatments – hospitals, schools, athletic facilities, other buildings, and textiles/carpets – also the US Army SBIR/STTR projects

Informatics models for prediction, assessment, distribution, and communication (situation awareness and notification) – RDA (UPMC), VSP (PNL), CUBIT, mention some others

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Sensors and sensing
Why not to focus upon only the particular agent but the associative pathogens and conditions – related work in ID and other fields

The Basic Model
Data collection and identification of traffic/contact regions and channels
Projecting movement and exchange flow, and disruptive patterns (new rooms, facilities, equipment, etc.) – integration with BioFlow Maps (building upon RDA, VSP, and EcoSim)
Identification of regions and channels for bioprotection and inspection
Planning and scheduling the antimicrobial treatment plan
Planning adjustments and mods to existing hygiene and disinfectant ops
Instantiating the inspection and monitoring plan
Implementing the informatics and SACS complement for the appropriate population (workers, students, visitors) and for ongoing sensing-monitoring
Measuring the effectiveness of post-application surface cleaning, population hygiene activity, and updating from changes in movement patterns.

The Validation (Field Testing) Plan
How it differs from clinical trials of drugs and devices, how it is similar
Example case-study of how it can be done in one hospital, one athletic facility (choice TBD)
[Current work in progress – TBD depending upon grant outcomes]