Antibiotic-Resistant Infections Cost the U.S. Healthcare System in Excess of $20 Billion Annually

In addition, these avoidable infections result in more than $35 billion in societal costs and more than 8 million additional days spent in the hospital

BOSTON, MA and DURHAM, NC – Oct. 19, 2009 – The Alliance for the Prudent Use of Antibiotics (APUA) and Cook County Hospital (currently John H. Stroger, Jr. Hospital of Cook County), today announced the release of an eye-opening study on the economic impact of antibiotic overuse and antibiotic-resistant infections (ARIs) sponsored by an unrestricted educational grant from bioMérieux and the Centers for Disease Control and Prevention (CDC).

The authors conducted an exhaustive chart-by-chart review of 1,391 patients hospitalized in the year 2000, 188 of which had ARIs (13.5%). The medical costs attributed to these ARIs ranged from $18,588 to $29,069 per patient, while the duration of hospital stay was extended 6.4 – 12.7 days for affected patients. Additionally, the excess mortality attributed to ARIs alone was 6.5% — a death rate two-fold higher than in patients without ARIs. The authors also estimated the societal costs incurred at this hospital as a result of the ARIs to be between $10.7 and $15 million, which is the cost that hits the families of those infected.

The study, titled “Hospital and Societal Costs of Antimicrobial Resistant Infections in a Chicago Teaching Hospital: Implications for Antibiotic Stewardship,” analyzed the medical and human cost associated with ARIs. It was conducted at the Cook County (Stroger) Hospital of Chicago, IL. Several studies have looked at the medical costs of these infections, but this is the first to look at the cost to families as well.

Antibiotic resistance is fueled by misuse and overuse of antibiotics. Bacteria become resistant to the very medicines developed to treat and cure the infection they cause. ARIs include methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), and a growing number of additional pathogens that are developing resistance to many common antibiotics.

The study will be published in the Oct. 15 issue of Clinical Infectious Diseases, published by the Infectious Disease Society of America.

“The findings indicate that significant health and economic benefits could be realized through effective interventions to reduce antimicrobial-resistant and healthcare-associated infections,” according to Dr. Rebecca Roberts, Department of Emergency Medicine, Cook County (Stroger) Hospital and the lead study author.
“At a time when our country is debating how to deliver better, more affordable care, this study demonstrates the enormous cost savings that could be realized, for both the healthcare system and to individuals and their families. These costs will only continue to increase if we don’t amend our behavior and practice a more prudent usage of antibiotics,” said Dr. Stuart Levy, professor of medicine at Tufts University School of Medicine, a senior author of the paper and co-founder and president of the APUA, which initiated the study in accord with its mission to “preserve the power of antibiotics”.

**Extrapolating the costs nationwide**

“The results offer some good insight regarding just how much ARIs are costing the nation: not just in terms of dollars, but human life and suffering,” said Dr. Levy. “As the enormous costs identified here are viewed on a national scale, it is clear that effectively addressing the issue of antimicrobial-resistant infection is an essential element for stemming the rising tide of healthcare costs in the United States.”

“Further study is required, specifically to see how much we could save on a national level if we took some basic steps to halt the development of resistant infections and their spread within hospitals,” Dr. Levy said.

Dr. Roberts explained, “if we apply the conservative costs seen in the Cook County (Stroger) Hospital study to all U.S. hospital admissions in the year 2000 and apply the same selection criteria used in that study nationwide, there would have been nearly 900,000 cases of ARIs in the year 2000.” By applying the range of additional costs seen in the Cook County (Stroger) Hospital study of $18,588 to $29,069 to this enormous number of ARIs, we could conceivably avoid $16.6 billion on the low end and up to $26 billion in additional healthcare costs stemming from the treatment of these preventable infections: "Even a 20% reduction in these infections would save between $3.2 and $5.2 billion a year and between 5.7 and 11.3 million additional days in the hospital. Clearly, any discussion of healthcare reform must look at the cost of current clinical practice and the savings we could realize if we used antibiotics more prudently,” noted Dr. Roberts. “Imagine if these hospital beds and healthcare resources were used instead for preventive care or for under-served patients,” she added.

“Assuming 900,000 ARI cases in the year 2000, based on the conservative selection criteria used in our study, the total societal costs of ARIs to U.S. households in the year 2000 was approximately $35 billion,” Dr. Roberts added. “This includes lost wages from extended hospital stays and from premature deaths.”

"Keep in mind these data were collected in 2000, and the rate of notifications of antibiotic resistant cases has more than doubled since then, so these figures should be viewed as very conservative; further work is ongoing to estimate the current burden at state and national levels," said Prof. Susan Foster, a co-author and health economist at APUA.

“Another mitigating factor that may also cause us to underestimate the true burden is the excellent clinical practice where the study actually occurred,” said Dr. Levy. “To its credit, Cook County (Stroger) Hospital happens to have an enviably low rate of healthcare associated infections, including ARIs.”
A study suggested by the late Senator Edward M. Kennedy

In discussions with the late Senator Edward M. Kennedy on the topic of drug resistance and healthcare, “I spoke frequently with Senator Kennedy about the avoidable costs from the misuse of antibiotics,” Levy said. “Without fail, the senator always concluded our discussions on the topic by telling me that we need to quantify the cost of treating antibiotic-resistant infections in order to make any real progress toward an appropriate policy for antibiotic stewardship. In a very real sense, this study grew from those talks with the late senator.”

“This study is the first to quantify the alarming impact of antibiotic resistant infections on treatment costs and patient outcomes,” said Herb Steward, general manager and executive vice president bioMérieux North America, which funded this study. “It also highlights the vital role of simple, rapid and cost effective diagnostics in order to get the right information to clinicians as fast as possible so they can treat patients appropriately and use antibiotics prudently, while improving care and patient outcomes and reining in unnecessary costs.”

Societal impact more than just financial

“The societal financial impact of $15 million based on just over 188 cases of ARI is an alarming finding,” said Dr. Robert A. Weinstein, interim chairman, Department of Medicine, Cook County (Stroger) Hospital, professor of Medicine at Rush University Medical College, and a senior author and initiator of the project at Cook County (Stroger) Hospital. “Sustaining these kinds of costs is simply not tenable for individual families and for the economy at large. With healthcare reform and the focus on the direct cost of care, this study should remind us that every dollar spent to treat avoidable illness ripples throughout society and has an impact on individual, family, community, and corporate budgets across the nation.”

The additional cost of patient care resulting from ARIs is not the only aspect of this study that has relevance to the ongoing debate over healthcare reform. “One topic that all parties seem to find agreement on is the need to bring healthcare information technology into the 21st century,” said Dr. Weinstein. “We at Cook County (Stroger) Hospital have adopted an electronic medical records system, which made the review of literally thousands of pages of patient records and lab results infinitely easier. However, most hospitals in the U.S. still do not have EMR systems so this kind of review would be nearly impossible.”

“Thanks to the leadership of the Centers for Disease Control and Prevention’s National Healthcare Safety Network (NHSN), hospitals like ours have the tools and protocol to track ARIs,” Dr. Weinstein added. “However, this is a voluntary program. Several states mandate that their hospitals comply with NHSN protocols, but most do not. Until we have a uniform standard for reporting and disclosure, we may never know the true cost of these avoidable infections.”

References:

About Cook County (Stroger) Hospital

Cook County (Stroger) Hospital is part of the Cook County Health and Hospital System, the largest component of the safety net for healthcare in Chicago and suburban Cook County. Cook County and Rush Medical College are academic partners in medical education and research.

Caring for patients in need, regardless of ability to pay, has been the tradition of Cook County (Stroger) Hospital, which has 464 inpatient beds and is part of a medical system with three hospitals, public health department and the ambulatory and community health network with many sites around Cook County that provide both primary care and 50 specialty clinic services.

CCH is also home to a wide array of residency and fellowship programs and a pioneer of important medical and surgical techniques, with noted advances in the treatment of trauma and burn victims. At CCH, resident and attending physicians work together to meet the needs of the area’s multiethnic population.

About APUA

Dedicated to curbing antibiotic resistance.
Antibiotic resistance is one of the major public health threats of the 21st Century. Since 1981, APUA has been the premier organization dedicated to promoting proper antibiotic use and curbing antibiotic resistance worldwide. It promotes global public health by raising public awareness through education and research projects on proper antibiotic use and antibiotic resistance.

With members in over 100 countries and 60 country chapters, APUA supports individual and country-based activities to control and monitor antibiotic resistance. APUA facilitates the exchange of up-to-date information by forging international partnerships among scientists, healthcare providers, consumers, and policy makers.

APUA has a professional staff with expertise in medicine, microbiology, economics, health education, policy analysis, development and advocacy, ecology, international program development, and communications, with leadership from recognized medical and scientific experts, including Nobel laureates and members of national academies of medicine and science. For more information, visit APUA: Alliance for the Prudent Use of Antibiotics

About bioMérieux

bioMérieux is the sponsor of the Global S.M.A.R.T (Solutions to Manage the Antimicrobial Resistance Threat) Campaign and the World Healthcare-Associated Infection (HAI) Forum held at the Fondation Mérieux in France, Sept. 21-23. Infectious disease specialists from around the world gather at this biennial event to examine current trends and data and engage in a lively scientific exchange about future challenges and actions to take in the fight against HAIs.
Advancing Diagnostics to Improve Public Health

A world leader in the field of *in vitro* diagnostics for over 45 years, bioMérieux is present in 150 countries through 39 subsidiaries and a large network of distributors. In 2008, revenues reached €1.111 billion with 84% of sales outside of France.

bioMérieux provides diagnostic solutions (reagents, instruments, software) that determine the source of disease and contamination to improve patient health and ensure consumer safety. Its products are used for diagnosing infectious diseases and providing high medical value results for cancer screening and monitoring and cardiovascular emergencies. They are also used for detecting microorganisms in agri-food, pharmaceutical and cosmetic products. bioMérieux is listed on the NYSE Euronext Paris market (Code: BIM – Code ISIN: FR0010096479). Other information can be found at [www.biomerieux.com](http://www.biomerieux.com).

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