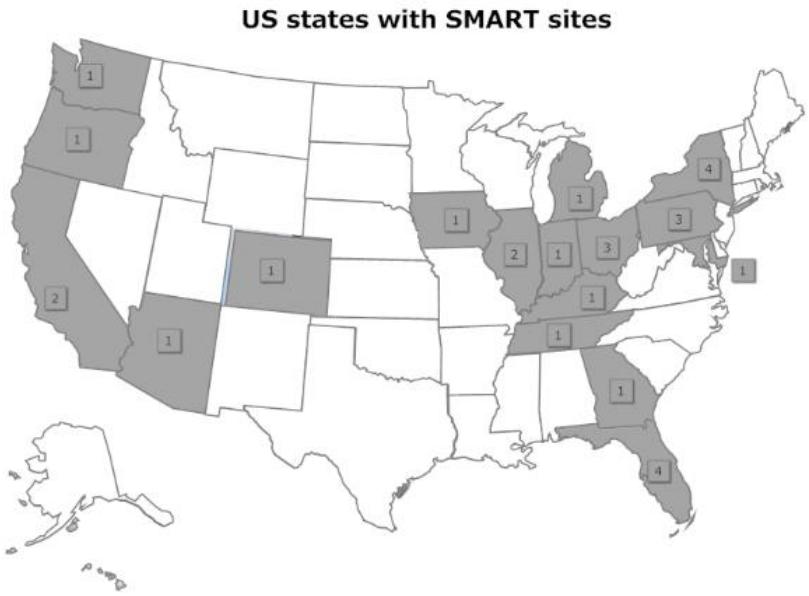

Figure S1. States with hospitals that participated in SMART between 2009 and 2013. Number of sites in each state are shown in the label.

Supplementary data.

Genomic DNA was extracted from overnight colonies grown on blood agar (Remel, Lenexa, KS) using the QIAamp DNA Mini Kit and the QIAcube instrument (Qiagen, Valencia, CA) according to the manufacturer's instructions. Genes encoding β-lactamases (*bla*) were detected using five separate multiplex PCR reactions: (1) *bla*$_{TEM}$, *bla*$_{SHV}$, *bla*$_{VEB}$, *bla*$_{PER}$, *bla*$_{GES}$, and *bla*$_{SPM}$; (2) *bla*$_{IMP}$, *bla*$_{VIM}$, *bla*$_{OXA-48}$, *bla*$_{NDM}$, and *bla*$_{KPC}$; (3) *bla*$_{ACC}$, *bla*$_{ACT,}$ *bla*$_{MIR}$, *bla*$_{CMY}$, *bla*$_{MOX}$, *bla*$_{DHA}$, and *bla*$_{FOX}$; (4) *bla*$_{CTX-M-1}$, *bla*$_{CTX-M-2}$, and *bla*$_{CTX-M-9}$; (5) *bla*$_{CTX-M-8}$ and *bla*$_{CTX-M-25}$. Multiplex PCR reactions to detect all genes but *bla*$_{CTX-M-8}$ and *bla*$_{CTX-M-25}$ were performed using the Multiplex PCR kit (Qiagen), whereas the CTX-M-8/25 reaction was performed using the Fast Cycling PCR kit (Qiagen). All reactions were performed per the manufacturer's instructions using primers listed in Table S1. All genes were amplified for sequencing using the Fast Cycling PCR kit (Qiagen) per the manufacturer's instructions using primers listed in Table S1. Sanger sequencing of PCR amplicon was performed at ACGT, Inc. (Wheeling, IL). Sequence data was analyzed using SeqScape v.2.7 (Applied Biosystems) and compared to sequences available from the National Center for Biotechnology Information (www.ncbi.nlm.nih.gov) and the Lahey Clinic (www.lahey.org).

bla$_{SHV}$ and *bla*$_{TEM}$ encoding SHV-type and TEM-type enzymes containing amino acid substitutions common to ESBLs (SHV G238S, G238A, E240K; TEM E104K, R164S, R164C, R164H, G238S) were identified by limited sequencing or by using the Check-MDR CT101 microarray (Check-Points B.V., Wageningen, the Netherlands). Full sequence was obtained only for *bla*$_{SHV}$ or *bla*$_{TEM}$ containing substitutions common to ESBLs. All other *bla* genes were sequenced in their entirety.

Table S1. Primers used for multiplex PCR, gene amplification, and sequencing

Primer	Sequence (5'- 3')	Reference
For *bla* gene detection by multiplex PCR		
ACC-MF	AACAGCCTCAGCAGCCGGTTA	Perez-Perez and Hanson, 2002 (1)
ACC-MR	TTCGCCGCAATCATCCCTAGC	Perez-Perez and Hanson, 2002 (1)
CIT-MF (CMY-II)	TGGCCAGAACTGACAGGCAAA	Perez-Perez and Hanson, 2002 (1)
CIT-MR (CMY-II)	TTTCTCCTGAACGTGGCTGGC	Perez-Perez and Hanson, 2002 (1)
CTX-M1-F2	AAAAATCACTGCGCCAGTTC	Woodford *et al*, 2006 (2)
CTX-M1-R2	AGCTTATTCATCGCCACGTT	Woodford *et al*, 2006 (2)
CTX-M2-F2	CGACGCTACCCCTGCTATT	Woodford *et al*, 2006 (2)

Primer	Sequence (5'- 3')	Reference
CTX-M2-R2	CCAGCGTCAGATTTTTCAGG	Woodford *et al*, 2006 (2)
CTX-M8-A	TCGCGTTAAGCGGATGATGC	Woodford *et al*, 2006 (2)
CTX-M25-A	GCACGATGACATTCGGG	Woodford *et al*, 2006 (2)
CTX-M8/25-B	AACCCACGATGTGGGTAGC	Woodford *et al*, 2006 (2)
CTX-M9-F2	CAAAGAGAGTGCAACGGATG	Woodford *et al*, 2006 (2)
CTX-M9-R2	ATTGGAAAGCGTTCATCACC	Woodford *et al*, 2006 (2)
DHA-MF	AACTTTCACAGGTGTGCTGGGT	Perez-Perez and Hanson, 2002 (1)
DHA-MR	CCGTACGCATACTGGCTTTGC	Perez-Perez and Hanson, 2002 (1)
EBC-MF (ACT/ MIR)	TCGGTAAAGCCGATGTTGCGG	Perez-Perez and Hanson, 2002 (1)
EBC-MR (ACT/ MIR)	CTTCCACTGCGGCTGCCAGTT	Perez-Perez and Hanson, 2002 (1)
FOX-MF	AACATGGGGTATCAGGGAGATG	Perez-Perez and Hanson, 2002 (1)
FOX-MR	CAAAGCGCGTAACCGGATTGG	Perez-Perez and Hanson, 2002 (1)
GES-F	AGTCGGCTAGACCGGAAAG	Dallenne *et al*, 2010 (3)
GES-R	TTTGTCCGTGCTCAGGAT	Dallenne *et al*, 2010 (3)
IMP2-F	GGAATAGAGTGGCTTAAYTCTC	Poirel *et al*, 2011 (4)
IMP2-R2	GGTTTAAYAAAACAACCACC	Poirel *et al*, 2011 (4)
KPCy-F	TGTCACTGTATCGCCGTC	Yigit *et al*, 2001 (5)
KPCy-R	CTCAGTGCTCTACAGAAAACC	Yigit *et al*, 2001 (5)
MOX-MF	GCTGCTCAAGGAGCACAGGAT	Perez-Perez and Hanson, 2002 (1)
MOX-MR	CACATTGACATAGGTGTGGTGC	Perez-Perez and Hanson, 2002 (1)
NDM-F	CCGTATGAGTGATTGCGGCG	Lascols *et al*, 2011 (6)
NDM-R	GCCCAATATTATGCACCCGG	Lascols *et al*, 2011 (6)
OXA-48-F	GCTTGATCGCCCTCGATT	Dallenne *et al*, 2010 (3)
OXA-48-R	GATTTGCTCCGTGGCCGAAA	Dallenne *et al*, 2010 (3)
PER-F	GCTCCGATAATGAAAGCGT	Dallenne *et al*, 2010 (3)
PER-R	TTCGGCTTGACTCGGCTGA	Dallenne *et al*, 2010 (3)
SHV-5	CCTTTAAAGTAGTGCTCTGC	This study
SHV-6	TTCGCTGACCGGCGAGTAGT	This study
SPM-F	AAAATCTGGGTACGCAAACG	Ellington *et al*, 2007 (7)
SPM-R	ACATTATCCGCTGGAACAGG	Ellington *et al*, 2007 (7)
TEM-3	CATTTCCGTGTCGCCCTTATTC	Dallenne *et al*, 2010 (3)
TEM-4	CGTTCATCCATAGTTGCCTGAC	Dallenne *et al*, 2010 (3)
VEB-F	CATTTCCCGATGCAAAGCGT	Dallenne *et al*, 2010 (3)
VEB-R	CGAAGTTTCTTTGGACTCTG	Dallenne *et al*, 2010 (3)
VIM-F	GATGGTGTTTGGTCGCATA	Ellington *et al*, 2007 (7)
VIM-R	CGAATGCGCAGCACCAG	Ellington *et al*, 2007 (7)
For *bla* gene amplification and sequencing		
CMY2-seqF	ATGATGAAAAAATCGTTATGCTGCGC	This study
CMY2-seqR	TTATTGCAGCTTTTCAAGAATGCGC	This study
CMY2int-seqF	GCAATGACCAGACGCGTC	This study
CMY2int-seqR	GACGCGTCTGGTCATTGC	This study
CTX-M1c-F	GACTATTCATGTTGTTGTTATTTC	Mena *et al*, 2006 (8)
CTX-M1c-R	TTACAAACCGTTGGTGACG	Mena *et al*, 2006 (8)
CTX-M1-R2	AGCTTATTCATCGCCACGTT	Woodford *et al*, 2006 (2)
CTX-M-1int Fseq	GACAGCTGGGAGACGAAACGTTC	This study

Primer	Sequence (5'- 3')	Reference
KPCy-F	TGTCACTGTATCGCCGTC	Yigit *et al*, 2001 (5)
KPCy-R	CTCAGTGCTCTACAGAAAACC	Yigit *et al*, 2001 (5)
KPCint-Fseq	CGCCAATTTGTTGCTGAAGGAG	This study
KPCint-Rseq	ACGTGGTATCGCCGATAGAGC	This study
SHV-seqF2	ATGCGTTATATTCGCCTGTGT	This study
SHV-seqR	TTAGCGTTGCCAGTGCTCG	This study
SHVint-seqF	GATCGGCGACAACGTCAC	This study
SHVint-seqR	GTGACGTTGTCGCCGATC	This study
TEM-3	CATTTCCGTGTCGCCCTTATTC	Dallenne *et al*, 2010 (3)
TEM2-extended	TTACCAATGCTTAATCAGTGAGG	This study
TEMint-seqF	GTGCTGCCATAACCATGAGTG	This study
TEMint-seqR	CACTCATGGTTATGGCAGCAC	This study

1. Perez-Perez FJ and Hanson ND. Detection of plasmid-mediated AmpC beta-lactamase genes in clinical isolates by using multiplex PCR. *J Clinical Microbiol* 2002; 40: 2153-2162.

2. Woodford N, Fagan, EJ, Ellington MJ. Multiplex PCR for rapid detection of genes encoding CTX-M extended-spectrum beta-lactamases. *J Antimicrob Chemother* 2006; 57:154-155.

3. Dallenne C, Da Costa A, Decre D, *et al*. Development of a set of multiplex PCR assays for the detection of genes encoding important beta-lactamases in *Enterobacteriaceae*. *J Antimicrob Chemother* 2010; 65: 490-495.

4. Poirel L, Walsh TR, Cuvillier V, *et al*. Multiplex PCR for detection of acquired carbapenemase genes. *Diagnos Microb Inf Dis* 2011; 70: 119-123.

5. Yigit H, Queenan AM, Anderson GJ, *et al*. Novel carbapenem-hydrolyzing beta-lactamase, KPC-1, from a carbapenem-resistant strain of *Klebsiella pneumoniae*. *Antimicrob Agents Chemother* 2001; 45:1151-1161.

6. Lascols C, Hackel M, Marshall SH, *et al*. Increasing prevalence and dissemination of NDM-1 metallo-β-lactamase in India: data from the SMART study (2009). *J Antimicrob Chemother* 2011; 9: 1992-1997.

7. Ellington MJ, Kistler J, Livermore DM, *et al*. Multiplex PCR for rapid detection of genes encoding acquired metallo-beta-lactamases. *J Antimicrob Chemother* 2007; 59: 321-322.

8. Mena A, Plasencia V, Garcia L, et al. Characterization of a large outbreak by CTX-M-1-producing *Klebsiella pneumoniae* and mechanisms leading to *in vivo* carbapenem resistance development. *J Clin Microbiol* 2006; 44: 2831-2837.