

CLABSI Rates per 1,000 Central Line-Days in Limited-Resource Countries (2002–2011)

Country	ICU Type	Number of Patients	CLABSIs per 1,000 Central Line-Days	Year
Albania ¹	Adult, PICU, NICU	968	—	2008
Argentina (INICC) ²	Adult	3,319	30.3	2004
Argentina ³	Adult	2,525	2.7	2004
Argentina ⁴	Adult	—	11.4	2002
Brazil (INICC) ⁵	Adult	1,031	9.1	2008
Brazil ⁶	Adult, PICU	320	34.0	2003
Brazil ⁷	PICU	515	10.2	2003
Brazil ⁸	NICU	225	60.0	2002
Brazil ⁹	NICU	6,243	3.1	2007
Brazil ¹⁰	NICU	1,443	17.3	2010
China (INICC) ¹¹	Adult	391,527	3.1	2011
Colombia (INICC) ¹²	Adult	2,172	11.3	2006
Cuba (INICC) ¹³	Adult	1,982	2.0	2011
El Salvador (INICC) ¹⁴	PICU	1,145	10.1	2011
El Salvador (INICC) ¹⁴	NICU	1,270	16.1	2011
India (INICC) ¹⁵	Adult	10,835	7.9	2007
India ¹⁶	Adult, PICU, NICU	—	0.48	2010
India ¹⁷	NICU	—	27.0	2011
Iran ¹⁸	Adult	106	147.3	2004
Lebanon (INICC) ¹⁹	Adult	666	5.2	2011
Mexico (INICC) ²⁰	Adult	1,055	23.1	2006
Morocco (INICC) ²¹	Adult	1,731	15.7	2009
Peru (INICC) ²²	Adult	1,920	7.7	2008
Peru ²³	PICU	414	18.1	2010
Philippines (INICC) ²⁴	Adult	2,887	4.6	2011
Philippines (INICC) ²⁴	PICU	252	8.23	2011
Philippines (INICC) ²⁴	NICU	1,813	20.8	2011
Poland (INICC) ²⁵	Adult	847	4.01	2011
Saudi Arabia ²⁶	NICU	—	8.2	2009
Tunisia ²⁷	Adult	340	15.3	2006
Tunisia ²⁸	Adult	647	14.8	2007
Turkey (INICC) ²⁹	Adult	3,288	17.6	2007
Turkey ³⁰	Adult	509	11.8	2010
Turkey ³¹	Adult	6,005	2.8	2011
INICC 8 countries ³² : Argentina, Brazil, Colombia, India, Mexico, Morocco, Peru, Turkey	Adult, PICU, NICU	21,069	18.5	2006
INICC 18 countries ³³ : Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, El Salvador, India, Kosovo, Lebanon, Macedonia, Mexico, Morocco, Nigeria, Peru, Philippines, Turkey, Uruguay	Adult, PICU	43,114	9.2	2008

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CLABSI Rates per 1,000 Central Line–Days in Limited-Resource Countries (2002–2011) *Continued*

Country	ICU Type	Number of Patients	CLABSIs per 1,000 Central Line–Days	Year
INICC 18 countries ³³ : Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, El Salvador, India, Kosovo, Lebanon, Macedonia, Mexico, Morocco, Nigeria, Peru, Philippines, Turkey, Uruguay	NICU	1,323	14.8	2008
INICC 25 countries ³⁴ : Argentina, Brazil, China, Colombia, Costa Rica, Cuba, El Salvador, Greece, India, Jordan, Kosovo, Lebanon, Lithuania, Macedonia, Mexico, Morocco, Pakistan, Panama, Peru, Philippines, Thailand, Tunisia, Turkey, Venezuela, Vietnam	Adult, PICU	144,323	7.6	2010
INICC 25 countries ³⁴ : Argentina, Brazil, China, Colombia, Costa Rica, Cuba, El Salvador, Greece, India, Jordan, Kosovo, Lebanon, Lithuania, Macedonia, Mexico, Morocco, Pakistan, Panama, Peru, Philippines, Thailand, Tunisia, Turkey, Venezuela, Vietnam	NICU	9,156	13.9	2010
INICC 36 countries ³⁵ : Argentina, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Greece, India, Jordan, Kosovo, Lebanon, Lithuania, Macedonia, Malaysia, Mexico, Morocco, Pakistan, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Singapore, Sri Lanka, Sudan, Thailand, Tunisia, Turkey, Uruguay, Venezuela, Vietnam	Adult, PICU	295,264	6.8	2011
INICC 36 countries ³⁵ : Argentina, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Greece, India, Jordan, Kosovo, Lebanon, Lithuania, Macedonia, Malaysia, Mexico, Morocco, Pakistan, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Singapore, Sri Lanka, Sudan, Thailand, Tunisia, Turkey, Uruguay, Venezuela, Vietnam	NICU	15,420	12.2	2011
INICC 15 countries ³⁶ : Argentina, Brazil, Colombia, Dominican Republic, El Salvador, India, Jordan, Malaysia, Mexico, Morocco, Peru, Philippines, Thailand, Tunisia, Turkey	NICU	13,251	13.7	2011

Note: CLABSI: central line–associated bloodstream infection; ICU: intensive care unit; PICU: pediatric intensive care unit; NICU: neonatal intensive care unit; INICC: International Nosocomial Infection Control Consortium.

Source: Personal communication, Victor Rosenthal, Mar 29, 2012. Used with permission.

References

- Faria S, Sodano L, Dauri M, et al. First point prevalence survey of nosocomial infections in the intensive care units of a tertiary care hospital in Albania. *J Hosp Infect.* 2008 May;69(1):95–97.
- Rosenthal VD, Guzmán S, Crnich C. Device-associated nosocomial infection rates in intensive care units of Argentina. *Infect Control Hosp Epidemiol.* 2004 Mar;25(3):251–255.
- Gnass SA, Barboza L, Bilicich D, Angeloro P, Treiwer W, Grenóvero S, Basualdo J. Prevention of central venous catheter–related bloodstream infections using non-technologic strategies. *Infect Control Hosp Epidemiol.* 2004 Aug;25(8):675–677.
- Bantar C, Bustos JL, Vesco E, Morera G. Residence of Internal Medicine Group. Central venous catheter–related infection: A prospective, observational study to assess the incidence rate at a teaching hospital in Argentina. *Infect Control Hosp Epidemiol.* 2002 Dec;23(12):757–758.
- Salomao R, Rosenthal VD, Grimberg G, et al. Device-associated infection rates in intensive care units of Brazilian hospitals: Findings of the International Nosocomial Infection Control Consortium. *Rev Panam Salud Publica.* 2008 Sep;24(3):195–202.
- Rosenthal VD, Ramachandran B, Villamil-Gómez W, Armas-Ruiz A, Navoa-Ng JA. Impact of a multidimensional infection control strategy on central line–associated bloodstream infections rates and mortality in pediatric intensive care units of 6 developing countries: Findings of the International Nosocomial Infection Control Consortium (INICC). *Infection*, forthcoming.
- Abramczyk ML, Carvalho WB, Carvalho ES, Medeiros EA. Nosocomial infection in a pediatric intensive care unit in a developing country. *Braz J Infect Dis.* 2003 Dec;7(6):375–380.
- Rosenthal VD, Kumar-Todi S, Álvarez-Moreno C, Abouqal R, Mitrev Z. Effectiveness of a multi-faceted prevention model for ventilator-associated pneumonia in adult intensive care units from 16 developing countries: Findings of the International Nosocomial Infection Control Consortium (INICC). *Crit Care Med*, forthcoming.

9. Rosenthal VD, Berba R, Dueñas L, Aygun C, Sobreira-Oropeza M, Barkat A. Effectiveness of multi-faceted infection control program to reduce central line-associated bloodstream infections in neonatal intensive care units of 11 developing countries: Findings of the International Nosocomial Infection Control Consortium (INICC). *Am J Infect Control*, forthcoming.
10. Brito DV, Brito CS, Resende DS, Moreira do Ó J, Abdallah VO, Gontijo Filho PP. Nosocomial infections in a Brazilian neonatal intensive care unit: A 4-year surveillance study. *Rev Soc Bras Med Trop*. 2010 Nov–Dec;43(6):633–637.
11. Tao L, Hu B, Rosenthal VD, Gao X, He L. Device-associated infection rates in 398 intensive care units from Shanghai, China: International Nosocomial Infection Control Consortium (INICC) findings. *Int J Infect Dis*. 2011 Nov;15(11):e774–780.
12. Moreno CA, Rosenthal VD, Olarte N, et al. Device-associated infection rate and mortality in intensive care units of 9 Colombian hospitals: Findings of the International Nosocomial Infection Control Consortium. *Infect Control Hosp Epidemiol*. 2006 Apr;27(4):349–356.
13. Guanache-Garcell H, Requejo-Pino O, Rosenthal VD, Morales-Pérez C, Delgado-Gonzalez O, Fernández-González D. Device-associated infection rates in adult intensive care units of Cuban university hospitals: International Nosocomial Infection Control Consortium (INICC) findings. *Int J Infect Dis*. 2011 May;15(5):e357–362.
14. Dueñas L, Bran de Casares A, Rosenthal VD, Jesús Machuca L. Device-associated infections rates in pediatrics and neonatal intensive care units in El Salvador: Findings of the INICC. *J Infect Dev Ctries*. 2011 Jun;5(6):445–451.
15. Mehta A, Rosenthal VD, Mehta Y, et al. Device-associated nosocomial infection rates in intensive care units of seven Indian cities. Findings of the International Nosocomial Infection Control Consortium (INICC). *J Hosp Infect*. 2007 Oct;67(2):168–174.
16. Singh S, Pandya Y, Patel R, Paliwal M, Wilson A, Trivedi S. Surveillance of device-associated infections at a teaching hospital in rural Gujarat—India. *Indian J Med Microbiol*. 2010 Oct–Dec;28(4):342–347.
17. Chopdekar K, Chande C, Chavan S, et al. Central venous catheter-related blood stream infection rate in critical care units in a tertiary care, teaching hospital in Mumbai. *Indian J Med Microbiol*. 2011 Apr–Jun;29(2):169–171.
18. Askarian M, Hosseini RS, Kheirandish P, Assadian O. Incidence and outcome of nosocomial infections in female burn patients in Shiraz, Iran. *Am J Infect Control*. 2004 Feb;32(1):23–26.
19. Kanj SS, Kanafani ZA, Sidani N, Alamuddin L, Zahreddine N, Rosenthal VD. International Nosocomial Infection Control Consortium findings of device-associated infections rate in an intensive care unit of a Lebanese university hospital. *J Glob Infect Dis*. 2012 Jan–Mar;4(1):15–21.
20. Ramirez Barba EJ, Rosenthal VD, Higuera F, et al. Device-associated nosocomial infection rates in intensive care units in four Mexican public hospitals. *Am J Infect Control*. 2006 May;34(4):244–247.
21. Madani N, Rosenthal VD, Dendane T, Abidi K, Zeggwagh AA, Abouqal R. Health-care associated infections rates, length of stay, and bacterial resistance in an intensive care unit of Morocco: Findings of the International Nosocomial Infection Control Consortium (INICC). *Int Arch Med*. 2009 Oct 7;2(1):29.
22. Cuellar LE, Fernandez-Maldonado E, Rosenthal VD, et al. Device-associated infection rates and mortality in intensive care units of Peruvian hospitals: Findings of the International Nosocomial Infection Control Consortium. *Rev Panam Salud Publica*. 2008 Jul;24(1):16–24.
23. Becerra MR, Tantaleán JA, Suárez VJ, Alvarado MC, Candela JL, Urcia FC. Epidemiologic surveillance of nosocomial infections in a pediatric intensive care unit of a developing country. *BMC Pediatr*. 2010 Sep 10;10:66.
24. Navoa-Ng JA, Berba R, Galapia YA, et al. Device-associated infections rates in adult, pediatric, and neonatal intensive care units of hospitals in the Philippines: International Nosocomial Infection Control Consortium (INICC) findings. *Am J Infect Control*. 2011 Sep;39(7):548–554.
25. Kübler A, Duszynska W, Rosenthal VD, et al. Device-associated infection rates and extra length of stay in an intensive care unit of a university hospital in Wroclaw, Poland: International Nosocomial Infection Control Consortium's (INICC) findings. *J Crit Care*. 2011 Feb;27(1):105.e5–10.
26. Balkhy HH, Alsaif S, El-Saed A, Khawajah M, Dichinee R, Memish ZA. Neonatal rates and risk factors of device-associated bloodstream infection in a tertiary care center in Saudi Arabia. *Am J Infect Control*. 2010 Mar;38(2):159–161.
27. Ben Jaballah N, Bouziri A, Kchaou W, et al. Epidemiology of nosocomial bacterial infections in a neonatal and pediatric Tunisian intensive care unit. *Med Mal Infect*. 2006 Jul;36(7):379–385.
28. Ben Jaballah N, Bouziri A, Mnif K, Hamdi A, Khaldi A, Kchaou W. Epidemiology of hospital-acquired bloodstream infections in a Tunisian pediatric intensive care unit: A 2-year prospective study. *Am J Infect Control*. 2007 Nov;35(9):613–618.
29. Leblebicioglu H, Rosenthal VD, Arkan OA, et al. Device-associated hospital-acquired infection rates in Turkish intensive care units. Findings of the International Nosocomial Infection Control Consortium (INICC). *J Hosp Infect*. 2007 Mar;65(3):251–257.
30. Dogru A, Sargin F, Celik M, Sagioglu AE, Goksel MM, Sayhan H. The rate of device-associated nosocomial infections in a medical surgical intensive care unit of a training and research hospital in Turkey: One-year outcomes. *Jpn J Infect Dis*. 2010 Mar;63(2):95–98.
31. Tutuncu EE, Gurbuz Y, Sencan I, Ozturk B, Senturk GC, Kilic AU. Device-associated infection rates and bacterial resistance in the intensive care units of a Turkish referral hospital. *Saudi Med J*. 2011 May;32(5):489–494.
32. Rosenthal VD, Maki DG, Salomao R, et al. Device-associated nosocomial infections in 55 intensive care units of 8 developing countries. *Ann Intern Med*. 2006 Oct 17;145(8):582–591.
33. Rosenthal VD, Maki DG, Mehta A, et al. International Nosocomial Infection Control Consortium report, data summary for 2002–2007, issued January 2008. *Am J Infect Control*. 2008 Nov;36(9):627–637.
34. Rosenthal VD, Maki DG, Jamulitrat S, et al. International Nosocomial Infection Control Consortium (INICC) report, data summary for 2003–2008, issued June 2009. *Am J Infect Control*. 2010 Mar;38(2):95–104.e2.
35. Rosenthal VD, Bijie H, Maki DG, Mehta Y, Apisarnthanarak A, Medeiros EA, Leblebicioglu H, Fisher D, Alvarez-Moreno C, Khader IA, Del Rocío González Martínez M, Cuellar LE, Navoa-Ng JA, Abouqal R, Garcell HG, Mitrev Z, Pirez García MC, Hamdi A, Dueñas L, Cancel E, Gurskis V, Rasslan O, Ahmed A, Kanj SS, Ugalde OC, Mapp T, Raka L, Meng CY, Thu LT, Ghazal S, Gikas A, Narváez LP, Mejía N, Hadjieva N, Gamar Elanbya MO, Guzmán Sirtt ME, Jayatilleke K; INICC members. International Nosocomial Infection Control Consortium (INICC) report, data summary of 36 countries, for 2004–2009. *Am J Infect Control*. Epub. 2011 Sep 10.
36. Rosenthal VD, Lynch P, Jarvis WR, et al. Socioeconomic impact on device-associated infections in limited-resource neonatal intensive care units: Findings of the INICC. *Infection*. 2011 Oct;39(5):439–450.