

Known Costs of Outcomes

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| Absenteeism | <p>Annual cost of lost productivity due to absenteeism in millions:</p> <p>Professionals (excluding nurses, physicians, teachers) \$24.2</p> <p>Managers, executives \$15.7</p> <p>Service workers \$8.5</p> <p>Clerical/office workers \$8.1</p> <p>Sales \$6.8</p> <p>School teachers (K-12) \$5.6</p> <p>Nurses \$3.6</p> <p>Transportation \$3.5</p> <p>Business owners \$2.0</p> <p>Installation/repair \$1.5</p> <p>Construction/mining \$1.3</p> <p>Physicians \$0.25</p> <p>Farmers/foresters/fishers \$0.16</p> <p>Productivity losses due to absenteeism: \$1,685 per employee annually</p> | <p>Folger, J. (2019). <i>The causes and costs of absenteeism</i>. Investopedia. Retrieved from https://www.investopedia.com/articles/personal-finance/070513/causes-and-costs-absenteeism.asp</p> <p>Stinson, C. (2015). Worker illness and injury costs U.S. employers \$225.8 billion annually. Centers for Disease Control and Prevention (CDC) Foundation. https://www.cdcfoundation.org/pr/2015/worker-illness-and-injury-costs-us-employers-225-billion-annually</p> |
| Adverse Drug Events | <p>Estimated extra cost per case in 2015 dollars \$5,746</p> | <p>Agency for Healthcare Research and Quality. (2017) Final report estimating the additional hospital inpatient cost and mortality associated with selected hospital-acquired conditions. AHRQ Publication No. 18-0011-EF. Retrieved from www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html</p> |
| Anemia and other deficiencies | <p>Direct cost related to an admission \$11,433, ER visits \$624, office visits \$528, outpatient visits \$7,615 and pharmacy expenses \$5,988</p> <p>\$1,278 mean expenditure per person US, 2017</p> | <p>Cai B, Said Q, Li X, Li FY, Arcona S. Healthcare costs and resource utilization in patients with severe aplastic anemia in the US. <i>Journal of Medical Economics</i>. 2019;22(10):1055-1062. doi:10.1080/13696998.2019.1643354</p> <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> |
| Annual healthcare cost | <p>AHRQ estimates pressure ulcers cost the healthcare industry between \$9.1 and \$11.6 billion annually</p> <p>\$2,00 to \$20,000 depending on stage and severity</p> <p>\$5,892 annually per person for individuals over age 65.</p> | <p>Becker's Clinical Leadership & Infection Control (2020) https://www.beckershospitalreview.com/quality/4-direct-and-indirect-costs-of-pressure-ulcers.html</p> |

| | <ul style="list-style-type: none"> • Surgical admission average price \$43,810 • Medical admission average price \$19,672 • Labor/delivery/newborn admissions \$9,851 • Mental health admissions \$9,879 • Substance abuse admissions \$11,598 • Outpatient surgery average price \$5,291 • Outpatient visit average price \$2,504 • Emergency Room visit average price \$2,096 • Ambulances average price \$696 • Radiology procedures average price \$630. • Professional Services average prices for Administered drugs \$813 Anesthesia procedures \$755 Office visits \$118 Surgical \$436 Radiology \$138 Lab/Pathology \$28 ER \$401 Physical Medicine \$44 Psychiatry \$102 Immunizations \$72 | <p>2018 Health Care Cost and Utilization Report (2018). Health care Cost Institute. https://healthcostinstitute.org/images/pdfs/HCCI_2018_Health_Care_Cost_and_Utilization_Report.pdf</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>Asthma</p> | <table border="1"> <thead> <tr> <th>Sex</th> <th>Excess Direct Costs</th> <th>Excess Indirect Costs</th> </tr> </thead> <tbody> <tr> <td>Female</td> <td></td> <td></td> </tr> <tr> <td>15–30</td> <td>43.94 M(27.74–60.14)</td> <td>188.46M (77.47–139.49)</td> </tr> <tr> <td>30–65</td> <td>91.12M (59.73–124.57)</td> <td>227.87M (161.06– 288.68)</td> </tr> <tr> <td>>65</td> <td>29.67M (18.68–40.66)</td> <td>24.62 (17.60–31.63)</td> </tr> <tr> <td>Male</td> <td></td> <td></td> </tr> <tr> <td>15–30</td> <td>40.06M (25.15–54.96)</td> <td>98.89 (70.12–127.66)</td> </tr> <tr> <td>30–65</td> <td>75.96M (47.72–104.20)</td> <td>187.50 (133.04–241.97)</td> </tr> <tr> <td>>65</td> <td>19.88M (12.36–27.39)</td> <td>18.54 (13.08–24.00)</td> </tr> <tr> <td>Total</td> <td>300.65M (190.14–411.16)</td> <td>662.91 (474.02–851.8)</td> </tr> </tbody> </table> <p>\$2,191 mean expenditure per person US, 2017</p> <p>Review of 26 intensive outpatient asthma self-management education and home visit programs 20 had great than \$1 ROI per \$1 invested; 3 had less than \$1 ROI per \$1 invested; 3 were variable</p> | Sex | Excess Direct Costs | Excess Indirect Costs | Female | | | 15–30 | 43.94 M(27.74–60.14) | 188.46M (77.47–139.49) | 30–65 | 91.12M (59.73–124.57) | 227.87M (161.06– 288.68) | >65 | 29.67M (18.68–40.66) | 24.62 (17.60–31.63) | Male | | | 15–30 | 40.06M (25.15–54.96) | 98.89 (70.12–127.66) | 30–65 | 75.96M (47.72–104.20) | 187.50 (133.04–241.97) | >65 | 19.88M (12.36–27.39) | 18.54 (13.08–24.00) | Total | 300.65M (190.14–411.16) | 662.91 (474.02–851.8) | <p>Yaghoubi, M., Adibi, A., Safari, A., FitzGerald, M., Sadatsafavi, M. (2019). The Projected Economic and Health Burden of Uncontrolled Asthma in the United States. <i>American Journal of Respiratory and Critical Care Medicine</i>, 2000(9): 1102-1112. https://www.atsjournals.org/doi/pdf/10.1164/rccm.201901-0016OC</p> <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> <p>Hsu, J., Wilhem, N., Lewis, L., & Herman, E. (2016). Economic evidence for U.S. asthma self-management education and home-based interventions. <i>Journal Allergy Clinical Immunology Practice</i>, 4(6): 1123–1134.e27. doi:10.1016/j.jaip.2016.05.012.</p> |
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| | <p>Average per child expenditure for treatment of asthma \$690</p> <p>Cost savings from fewer ED visits/hospitalizations resulted in ROI of 1.33. When benefits due to reduced missed school days and missed work days were added, the SROI increased to 1.85 (Societal)</p> | <p>Agency for Healthcare Research & Quality. (2015). Medical Expenditure Panel Survey Statistical Brief #472 Retrieved from https://meps.ahrq.gov/data_files/publications/st472/stat472.pdf</p> <p>Bhaumik, U. Norris, K., Charron, G., Walker, S., Sommer, S... Woods, E.. (2013). Cost Analysis for a Community-Based Case Management Intervention Program for Pediatric Asthma. <i>Journal of Asthma</i>, 2013; 50(3): 310–317.</p> |
| Autism Spectrum Disorder | <p>\$60,000 average cost per year to treat autism (includes special education and lost parental income)</p> <ul style="list-style-type: none"> • 461 Billion in 2025 without additional interventions • \$268 billion annual cost in 2017 and projected to be \$461 Billion in 2025 without additional interventions <p>\$17,081 per year</p> | <p>Autism Speaks (2017). <i>Autism and health: Advances in understanding and treating the health conditions that frequently accompany Autism</i>. https://www.autismspeaks.org/science-news/autism-and-health-special-report-autism-speaks</p> <p>Lavelle, T., Weinstein, M., Newhouse J., Munir, K., Kuhlthau K., & Prosser, L. (2014). Economic burden of childhood autism spectrum disorders. <i>Pediatrics</i>. 133. 520-529.</p> |
| Breast Milk | <p>1 ounce of banked breast milk costs \$3.97 to hospitals from Mothers' Milk Bank Northeast.</p> <p>Biologic mother ranged \$.051 to \$7.93 depending on the volume pumped daily. Donor human milk (DHM) cost was \$14.84 and commercial formula (CF) was \$3.18</p> <p>A year's supply of human milk costs \$20,000-\$35,000 A year's supply of powdered milk costs \$1,500-\$2,000</p> | <p>Washburn, L.(2019) Saint Barnabas in New Jersey opens milk depot, collects donations for babies in need. https://www.northjersey.com/story/news/health/2019/08/14/human-milk-bank-opens-depot-new-jersey/1960586001/</p> <p>Jegler, B., Johnson, T., Engstrom, J., Patel, A., Loera, F., & Meier, P. (2013). The institutional cost of acquiring 100 mL of human milk for very low birth weight infants in the neonatal intensive care unit. <i>Journal of Human Lactation</i>, 29(3), 390-399.</p> <p>Dale, E. (2013). Rising price of breast milk: Costs of breastfeeding. HuffPost Blog. https://www.huffingtonpost.com/elisabeth-dale/rising-price-of-breast-mi_b_3416768.html</p> |

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| <p>Cancer</p> | <p>Family support/assistance: Admission bag-\$100 Gas & food cards- provided Adopt a family: toys, supplies, essential household items, beds provided Wigs provided Ronald McDonald House-maintains an efficiency/apt Scholarships to survivors/immediate family members Partners with pediatric oncology teams \$3, 247annual mean cost of outpatient/office visits \$21,329 annual mean cost of in patient visits \$2,204 annual mean medication cost</p> <p>Cancer Treatment - \$6,677 mean expenditure per person US, 2017</p> | <p>Children's Cancer Network (2018) https://www.childrenscancernetwork.org/programs-and-services/family-assistance/</p> <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> |
| <p>Cataract Surgery</p> | <p>LASIK cost per eye \$2,246 in 2019</p> <p>\$1,705 mean expenditure per person US, 2017</p> | <p>Segre, L. (2019) LASIK eye surgery cost https://www.allaboutvision.com/visionsurgery/cost.htm</p> <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> |
| <p>CAUTI Catheter-Associated Urinary Tract Infections</p> | <p>CAUTI: \$48,108</p> <p>\$1,197 expenditure per person US, 2017</p> <p>Estimated cost per case in 2015 dollars \$13,793</p> | <p>Scott, R., Culler, S. and Rask, K. (2019). Understanding the economic impact of health care-associated infections: A cost perspective analysis. <i>The Art and Science of Infusion Nursing</i>, 42(2), 61-69. DOI: 10.1097/NAN.0000000000000313</p> <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> <p>Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html AHRQ Publication No. 18-0011-EF November 2017</p> |

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| CDI Clostridium Difficile | C. Diff: \$17,260 Estimated cost per case in 2015 dollars \$17,260 | Scott, R., Culler, S. and Rask, K. (2019). Understanding the economic impact of health care-associated infections: A cost perspective analysis. <i>The Art and Science of Infusion Nursing</i> , 42(2), 61-69. DOI: 10.1097/NAN.0000000000000313 Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html AHRQ Publication No. 18-0011-EF November 2017 |
| CLABSI Central Line Associated Bloodstream Infections | \$45,814 per case Estimated cost per case in 2015 dollars \$48,108 | Schmidt, R., Hunt, S., and Stapp, M. (2019). The budgetary impacts of hospital-acquired infections. <i>Journal of Business and Behavioral Sciences</i> , 31(1), 25-35. http://asbbs.org/files/2019/JBBS_31.1_Spring_2019.pdf#page=25 Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html AHRQ Publication No. 18-0011-EF November 2017 |
| Diabetes | Direct cost average of \$16,752/year but also substantial indirect costs due to lost productivity \$4,101 mean expenditure per person US, 2017 | Riddle, M. & Herman W., The cost of Diabetes Care – An elephant in the room, <i>Diabetes Care</i> 2018 May; 41(5): 929-932. https://doi.org/10.2337/dci18-0012 Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| Employee | General Injury - Multiple physical injuries per incidence: Direct cost \$73,749 Indirect cost \$81,123 Total cost \$154,872 Musculoskeletal Injuries Per strain: Direct \$33,140 Indirect \$36,454 Total \$69,594 Per sprain: Direct \$29,989 Indirect \$32,987 Total \$62,976 Needle Stick per incident: Direct \$25,523 Indirect \$28,075 Total \$53,598 | OSHA Safety Pays Program Estimator 2017 https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html OSHA Safety Pays Program Estimator 2017 https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html OSHA Safety Pays Program Estimator 2017 https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html |
| Epilepsy | \$4,009 mean expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |

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| Falls | \$14,000 extra to treat fall | Pennington, D. (2019). Reducing inpatient falls on a cardiovascular progressive care unit: A quality improvement study to implement interprofessional intentional rounding. https://commons.lib.jmu.edu/dnp201019/25 https://commons.lib.jmu.edu/dnp201019/25 |
| Glaucoma | \$1,179 mean expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| HAPU | HAPU/I as much as \$70,000 to treat Pressure ulcers: \$129,240 per case for stage IV Hospital-Acquired Pressure Ulcer Estimated extra cost per case in 2015 dollars \$14,506 | Joint Commission Center for Transforming Healthcare (2020) https://www.centerfortransforminghealthcare.org/improvement-topics/hospital-acquired-pressure-ulcers-prevention/ Schmidt, R., Hunt, S., and Stapp, M. (2019). The budgetary impacts of hospital-acquired infections. <i>Journal of Business and Behavioral Sciences</i> , 31(1), 25-35. http://asbbs.org/files/2019/JBBS_31.1_Spring_2019.pdf#page=25 Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html AHRQ Publication No. 18-0011-EF November 2017 |
| Heart Disease | \$5,137 expenditure per person US, 2017 \$53,384 Heart attack hospitalization median Coronary artery bypass ranged from \$85,891 to \$177,546 (2017) | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ American Heart Association News (2017). Uninsured patients faced devastating hospital bills for heart attack, stroke. https://newsarchive.heart.org/uninsured-patients-faced-devastating-hospital-bills-heart-attack-stroke/#:~:text=Heart%20attack%20hospitalizations%20cost%20a,and%20housing%2C%20according%20to%20researchers. AHA (2017) Catastrophic costs for hospitalization expenses common among uninsured heart and stroke patients. https://medicalxpress.com/news/2017-11-catastrophic-hospitalization-expenses-common-uninsured.html#:~:text=The%20cost%20for%20coronary%20artery,eliminating%20the%20cost%20of%20food |
| Hospital Stay | Average cost of inpatient day at US hospitals 2018 • State/local government hospitals \$2,260 • Nonprofit hospitals \$2,653 | Statista (5/12/2020) https://www.statista.com/statistics/630443/inpatient-day-hospital-costs-in-us-by-nonprofit-or-profit/ |

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| | • For-profit hospitals \$2,093 | |
| Hypertension | \$758 expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| Influenza | \$626 expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| Kidney Disease | \$5,104 expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| Lupus and connective tissues disorders | \$2,212 expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| Medication errors | Benchmark study about medication errors and medication reconciliation found medication errors cost \$21 billion in annual healthcare. Annual cost of 400,000 ADEs = \$3.5 billion annually | Accreditation Association for Ambulatory Health Care (AAAHC) (3/01/2020) https://www.reliasmedia.com/articles/145733-focus-on-preventing-medication-errors-in-2020 Patient Safety 2016 Final Report National Quality Forum (3-15-2017) http://www.qualityforum.org/Publications/2017/03/Patient_Safety_Final_Report.aspx |
| Mental Health | Pediatric - \$1317 per visit (2016) Medical cost for LOS greater than 24 hours- \$4,050 Adult - \$2,375 expenditure per person US, 2017 Pediatric - Average expenditure per child for treatment of mental disorders \$2,195 Adult – \$1,143 annual mean cost of outpatient/office visits \$12,126 annual mean cost of in patient visits \$966 annual mean medication cost \$1,020 annual mean ED visits cost Total Resource Utilization Charges/Mean Charges/Visit (Pediatrics): | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ MEPS Statistical Brief #472 April 2015 https://meps.ahrq.gov/data_files/publications/st472/stat472.pdf Agency for Healthcare Research & Quality (AHRQ) Medical Expenditure Panel Table 3a 2014 https://meps.ahrq.gov/mepsweb/data_stats/MEPS_topics.jsp?topicid=5Z-1 |

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| | <p>Depression-1.33 billion/\$13,200 Bipolar-702 million/\$17,058 Psychosis-540 million/\$19,676 Externalizing Disorder-264 million/\$18,784 Anxiety Disorder-149 million/\$19,118 ADHD-133 million/\$19,118 Eating Disorder-108 million/\$46,130 Substance Abuse-102 million/\$12,098 Reaction Disorder-100 million/\$8,444</p> <p>Adult –</p> <ul style="list-style-type: none"> • Estimated ROI was \$1.76 for commercial insurance and \$2.43 for Medicaid for patients discharged from a hospital • Estimated ROI was \$1.70 for commercial insurance and \$2.05 for Medicaid for patients discharged from a emergency department. Study support business case for payers to invest in post discharge follow-up calls | <p>Bardach, N., Coker, T., Zima, B., Murphy, J., Knapp, P., Richardson, L., Edwall, G., and Mangione-Smith, R. (2014). Common and costly Hospitalizations for Pediatric Mental Health Disorders. <i>Pediatrics</i>. 133(4), 602-609.</p> <p>Richardson, J., Mark, T., McKeon, R. (2014) The Return on Investment of post discharge follow-up calls for Suicide Ideation or Deliberate self-harm. <i>Psychiatric Services</i> 65(8) 1012-1019.</p> |
| MRSA Methicillin Resistant Staph Aureus | <p>\$38,500 per patient for MRSA-related pneumonia \$24,205 per patient to treat C. diff.</p> <p>@ \$38,500 for MRSA-related pneumonia @ \$40,700 for MSAA-related pneumonias @\$15,578 for MSSA-related infections @ \$14,792 for MRSA-related infections</p> | <p>Hospital-acquired infections and CMS Reimbursement: Implications for Hospitals (2018). http://lippincottolutions.lww.com/blog.entry.html/2018/10/23/hospital-acquiredin-fAJF.html</p> <p>Study: Superbug MRSA infections less costly, but still deadly UT Southwestern Medical Center (5/15/2018) https://www.eurekalert.org/pub_releases/2018-05/usmc-ss051518.php</p> |
| Narcan use | <p>Naloxone (generic name for Narcan) can be given 3 ways: Nasal spray (Narcan): average \$140 Intravenous injection (Naloxone)—usually used in hospitals or emergency dispatch Autoinjector (spring-loaded syringe similar to EpiPen)—average \$4000</p> | <p>Health Essentials (2020) Cleveland Clinic https://health.clevelandclinic.org/is-naloxone-narcan-sold-over-the-counter/</p> |
| Musculoskeletal Disorders | <p>Back Injury – \$2,243 mean expenditure per person US, 2017</p> <p>Osteoarthritis & non-traumatic joint disorders – \$2,566 expenditure per person US, 2017</p> | <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> |

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| | Bone Disease – \$1,656 expenditure per person US, 2017 | |
| Nervous System Disorders | \$2,340 expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| OB Adverse Events | Additional costs for Obstetric adverse events Range \$13-\$1190 with estimate of \$602 | AHRQ (2017). Estimating the additional hospital inpatient cost and mortality associated with selected hospital-acquired conditions. https://www.ahrq.gov/hai/pfp/haccost2017-results.html |
| Orientation New RN | Nurse Residency Program (NRP) -- \$97,777 (2019). <ul style="list-style-type: none"> Replacement cost for newly licenses nurse was calculated at \$44,085. Determined an NLRN must work 1,198 hours or 8.32 months (36 hours/week) in productive status to neutralize cost of orientation. Cost for NRP included manager salary, supplies, printing, parking and dietary costs. Break-even point for program cost is the prevention of turnover of three NLRNs during their first 8.32 months of work in productive status. | Wolford, J., Hampton, D., Tharp-Barrie, and Goss, C. (2019). Establishing a nurse residency program to boost new graduate nurse retention. <i>Nursing Management</i> , 50(3), 44-49. https://journals.lww.com/nursingmanagement/Fulltext/2019/03000/Establishing_a_nurse_residency_program_to_boost.7.aspx?casa_token=ILrm9ctMGMsAAAAA:AC7QgrTVmQSzxrJJ--rWpxfSFvTLOvL34TvOl4g-ujjIVj3wcsDzhHVTz1Y1IMC0WKVXsubeDGqOXsqvh2_HOgtY |
| Respiratory Disease Disorders | Bronchitis & URI - \$417 mean expenditure per person in US 2017 Pneumonia - \$4,532 expenditure per person US, 2017 Ventilator-associated pneumonia: \$47,238 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ Scott, R., Culler, S. and Rask, K. (2019). Understanding the economic impact of health care-associated infections: A cost perspective analysis. <i>The Art and Science of Infusion Nursing</i> , 42(2), 61-69. DOI: 10.1097/NAN.0000000000000313 Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html AHRQ Publication No. 18-0011-EF November 2017 Luckraz H, Manga N, Senanayake EL, Abdelazia, M., Goipal, S.....Andronis, L.. Cost of treating ventilator-associated pneumonia post cardiac surgery in the National |

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| | <p>Overall costs for VAP resulted in an additional cost of \$8829 vs. those treated for non-ventilator associated pneumonia.</p> <p>Median treatment costs per outpatient episode-\$346 (interquartile range \$195-\$551) in U.S. dollars Median costs per inpatient episode-\$4851 (interquartile range \$3313-\$7669) in U.S. dollars</p> | <p>Health Service: Results from a propensity-matched cohort study. <i>Journal of the Intensive Care Society</i>. 2018;19(2):94-100. doi:10.1177/1751143717740804 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5956688/</p> <p>Konomura, K., Nagai, H., Akazawa, M. (2017). Economic burden of community-acquired pneumonia among elderly patients: a Japanese perspective. <i>Pneumonia</i>. 9-19. https://pneumonia.biomedcentral.com/articles/10.1186/s41479-017-0042-1</p> |
| Stroke | <p>Cerebrovascular disease mean expenditure per person US, 2017 \$7,735</p> <p>\$31,218 for hospitalization for stroke</p> | <p>Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/</p> <p>American Heart Association News (2017). Uninsured patients faced devastating hospital bills for heart attack, stroke. https://newsarchive.heart.org/uninsured-patients-faced-devastating-hospital-bills-heart-attack-stroke/#:~:text=Heart%20attack%20hospitalizations%20cost%20a,and%20housing%2C%20according%20to%20researchers</p> |
| Subcutaneous Drug Delivery | <p>Global subcutaneous drug delivery market \$7,077.5 million</p> <p>Administration for SQ could contribute to a cost savings of 1.4-4.6 million euros per year</p> <p>Administration:</p> <ul style="list-style-type: none"> • Subcutaneous-\$30.19 • Intravenous-\$113.13 | <p>https://www.marketwatch.com/press-release/subcutaneous-drug-delivery-market-to-exhibit-ravishing-growth-by-2026-2020-03-17</p> <p>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4788333/</p> <p>Dychter, Gold, & Haller. (2012). Subcutaneous Drug Delivery. <i>The Art and Science of Infusion Nursing</i>. 154-160.</p> |
| Substance Use Disorder | <p>Alcohol: Alcohol treatment: \$500-\$650/day out of pocket for medical detox or residential care \$250-\$350/day for outpatient care</p> <p>The societal costs of alcohol misuse averages to around \$807 per citizen or roughly \$2.05 per drink</p> <p>Imprisonment cost annually per person \$24,000</p> | <p>American Addiction Centers (2020). <i>How much does alcohol rehab cost?</i> https://americanaddictioncenters.org/alcohol-rehab/cost</p> <p>Economic Impact of Alcohol Abuse in the US (2019) https://www.verywellmind.com/the-cost-of-excessive-alcohol-use-in-the-u-s-67482</p> <p>National Institute on Drug Abuse NIH) (January 2018)</p> |

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| | <p>\$630 cost per ED visit 2017</p> <p>Opioid Addiction Treatment: Ranges from \$5874 to \$15,183 (2019)</p> <p>Associated Costs</p> <ul style="list-style-type: none"> • Methadone treatment annual cost \$6,552 • Bupremorphine treatment annual cost \$5,980 • Naltrexone treatment annual cost \$14,112 <p>Tobacco: Cost per day based on 2016 data:</p> <ul style="list-style-type: none"> • 2 mg or 4 mg: \$1.90– \$3.70 (9 pieces)-nicotine gum • 2 mg or 4 mg: \$3.36-\$3.78 (9 pieces)-nicotine lozenges • \$1.52–\$3.48 patch-transdermal patch • \$6.67 (8 doses) nasal spray • \$11.35 (6 cartridges)-oral inhaler • \$2.58–\$7.87 (2 tablets)-Bupropion SR • \$11.86 (2 tablets)-Varenicline | <p>https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/frequently-asked-questions/drug-addiction-treatment-worth-its-cost</p> <p>Karaca, Z. and Moore, B. Costs of Emergency Department Visits for Mental and Substance Use Disorders in the United States, 2017. H-CUP US Statistical Brief #257. May, 2020. Agency for Healthcare Quality and Research, Rockville, MD. https://www.hcup-us.ahrq.gov/reports/statbriefs/sb257-ED-Costs-Mental-Substance-Use-Disorders-2017.pdf</p> <p>Leslie, D., Ba, D., Agbese, E., Xing, X., and Liu, G. (2019). The economic burden of the opioid epidemic on states: The case of Medicaid. AJMC https://www.ajmc.com/journals/supplement/2019/deaths-dollars-diverted-resources-opioid-epidemic/the-economic-burden-opioid-epidemic-on-states-case-of-medicaid</p> <p>How much does opioid treatment cost? National Institute-Drug Abuse NIH (2015) https://www.drugabuse.gov/publications/research-reports/medications-to-treat-opioid-addiction/how-much-does-opioid-treatment-cost</p> <p>U.S. Department of Health and Human Services. <i>Smoking Cessation: A Report of the Surgeon General</i>. Atlanta, GA: U.S. Department of Health and Human Services. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2020. https://www.hhs.gov/sites/default/files/2020-cessation-sgr-full-report.pdf</p> |
| <p>SSI</p> <p>Surgical Site Infection</p> | <p>SSI: \$28,219</p> <p>Estimated extra cost per case in 2015 dollars \$28,219</p> | <p>Scott, R., Culler, S. and Rask, K. (2019). Understanding the economic impact of health care-associated infections: A cost perspective analysis. <i>The Art and Science of Infusion Nursing</i>, 42(2), 61-69. DOI: 10.1097/NAN.0000000000000313</p> <p>Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html</p> |

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| | | AHRQ Publication No. 18-0011-EF November 2017 |
| Thyroid Disease | \$530 expenditure per person US, 2017 | Agency for Healthcare Research and Quality. Mean expenditure per person with care by condition, United States, 2017. Medical Expenditure Panel Survey. https://meps.ahrq.gov/mepstrends/hc_cond_icd10/ |
| Trauma | \$2,728 expenditure per person US, 2017 \$1,378 annual mean cost of outpatient/office visits \$20,786 annual mean cost of in patient visits \$144 annual mean medication cost \$1,209 annual mean ED visits cost | NCBI: National Cost of Trauma Care by Payer Status https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5995319/ Agency for Healthcare Research & Quality (AHRQ) Medical Expenditure Panel Table 3a 2014 https://meps.ahrq.gov/mepsweb/data_stats/MEPS_topics.jsp?topicid=5Z-1 |
| Turnover RN | Average cost of turnover for bedside RN from \$33,000 to \$56,000 with average of \$44,000 RN replacement cost \$22,000-\$64,000 with avg per RN leaving \$36,567 | 2020 NSI National Health Care Retention & RN Staffing report https://www.nsinursingsolutions.com/Documents/Library/NSI_National_Health_Care_Retention_Report.pdf Robert Wood Johnson Foundation (2020) http://www.rwjf.org/ |
| Vaccine preventable disease | Cost per Hospitalization & Cost per outpatient visit: Diphtheria-\$16,982 (IP)-\$100 (OP visit) Tetanus-\$102,584 (IP)-\$100 (OP visit) Pertussis-\$10,765-22,410 (IP)\$100-173 (OP visit) H-Flu-Meningitis \$4,111-\$38,270 (IP)-\$100-\$353 (OP) H-Flu Acute-\$18,195-\$49,236 (IP)-\$310-570 (OP) Poliomyelitis-\$7,781-\$50,554 (IP)-\$100 (OP visit) Measles-\$4,032-\$46,000 (IP)-\$88-\$526 (OP visit) Mumps-\$11,196-\$46,060 (IP)-\$110-556 (OP visit) Rubella-\$4,886-\$46,060 (IP)-\$89-\$651 (OP visit) Congenital rubella syn-\$62,233 (IP)\$110 (OP) Hepatitis B-\$15,662-\$27,051 (IP)-\$214-599 (OP) Varicella-\$4,136-\$22,113 (IP)-\$83-254 (OP visit) Pneumococcal-\$3,798-\$25,848 (IP)-\$86-272 (OP visit) Rotavirus-\$3,195-\$4,793 (IP)-\$135-455 (OP visit) May 2020 – updated the price list for the individual vaccinations | CDC Vaccine Price List (updated May 1, 2020) https://www.cdc.gov/vaccines/programs/vfc/awardees/vaccine-management/price-list/index.html |

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| Violence-workplace | <p>Average hospital costs post recidivism with standard referrals-\$18,722</p> <p>Savings of \$4,100 for 100 individuals Average hospital costs post recidivism (base case) \$6,513 (range-\$1,996-\$100,000) Cost of VIP-\$2,810</p> | <p>Chong, V., Smith, R., Garcia, A., Lee, W., Ashley, L., Marks, A., Liu, T., and Victorino, G. (2015). Hospital-centered hospital violence intervention programs: a cost-effectiveness analysis. <i>The American Journal of Surgery</i>. 209: 597-603</p> <p>Julliard, C. & Smith, R. (2015). Saving lives and saving money: Hospital-based violence intervention is cost-effective. <i>Journal Trauma Acute Care Surgery</i>. 78(2), 252-258.</p> |
| VRE Vancomycin Resist. Enterococci | <p>Mean attributable cost and length of stay for patients with VRE colonization/infection to be \$17,949 and 13.8 days</p> | <p>Mac, S., Fitzpatrick, T., Johnstone, J. <i>et al.</i> Vancomycin-resistant enterococci (VRE) screening and isolation in the general medicine ward: a cost-effectiveness analysis. <i>Antimicrobial Resistance & Infection Control</i> 8, 168 (2019). https://doi.org/10.1186/s13756-019-0628-x</p> |
| VTE Venous Thromboembolism | <p>Estimated extra cost per case \$17,367</p> | <p>Final Report Estimating the Additional Hospital Inpatient Cost and Mortality Associated with Selected Hospital-Acquired Conditions www.ahrq.gov/professionals/quality-patient-safety/pfp/haccost2017.html AHRQ Publication No. 18-0011-EF November 2017</p> |
| Wellness- screening Flu vaccine, metabolic syndrome | <p>\$150-\$1200 per year-cost per employee dependent on benefits offered \$3-\$7.50 per employee per month (\$60-\$90 per employee per year) for digital wellness platform that offers a health risk appraisal, incentive management, online resources, integration of fitness devices, and wellness campaigns \$40-\$75 per employee for biometric screening \$140-\$165 per employee for health coaching (6 sessions) \$200-\$800 per employee per year for benefits-based incentives</p> <p>Average savings of \$358 per employee per year in healthcare costs, program had an ROI of 148%</p> <p>Corporate Wellness Programs Return \$6 for Every \$1 Invested</p> | <p>Aldana, S. (2020) <i>How much does an employee wellness program cost?</i> WellSteps. https://www.wellsteps.com/blog/2020/01/02/employee-wellness-program-cost/</p> <p>Tommy Foy, Rocky J. Dwyer, Roy Nafarrete, Mohamad Saleh Saleh Hammoud, Pat Rockett. (2019) Managing job performance, social support and work-life conflict to reduce workplace stress. <i>International Journal of Productivity and Performance Management</i> 68:6, pages 1018-1041. https://www.ncsf.org/enew/articles/articles-corporatewellnessprogramsreturn.aspx</p> |

The ANPD ROI Task Force originally compiled ANPD's Known Costs of Outcomes table.

A special thanks to ANPD members for updating the document:

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Abbreviation legend:

AHRQ = Agency for Healthcare Research & Quality (AHRQ)

MEPS = Medical Expenditure Panel

NIH = National Institutes for Health

RWJF = Robert Wood Johnson Foundation

H-CUP Healthcare Cost and Utilization Project (AHRQ)

