

## Health Plans

After completing this section, students should be able to:

- Make rough estimates of the probability of health care events from available data.
- Make rough estimates of the average cost of health care procedures from available data.
- Estimate expected health care costs under simplifying assumptions.
- Explain how low probability, high cost events can make insurance important even when they expected cost of buying insurance is higher than the expected cost of not buying it.

## Introduction

The Student Blue Health Plan costs \$1,308.40 per semester. Here are the benefits:

StudentBlue	If you visit your Student Health Center or doctor in the Student Blue network (in-network provider):	If you visit a doctor NOT in the Student Blue network (out-of-network provider):
	All dollar amounts and percentages are what you, as a plan member, would pay.	
<b>Policy year deductible</b>	\$0 at Student Health Center \$500 per insured member in-network	\$500 per insured member
<b>Policy year out-of-pocket maximum</b>	\$0 at Student Health Center \$4,000 individual	\$8,000 individual
<b>Office visits</b> Includes office surgery, X-rays and labs	<b>Student Health Center:</b> No charge <b>Primary Care Provider and/or Specialist:</b> \$25 copayment, then 20% after deductible	<b>Primary Care Provider and/or Specialist:</b> \$25 copayment, then 30% after deductible
<b>MDLIVE® telehealth*</b>	\$10 copayment	Not applicable
<b>Preventive care</b> Routine examinations, well-child care, immunizations, gynecological exams, cervical cancer screening, ovarian cancer screening, screening mammograms, colorectal screening, bone mass measurement, newborn hearing screening and prostate specific antigen tests (PSA)	No charge at both Student Health Center and in-network	30% after deductible
<b>Urgent care centers and emergency room</b> Urgent care centers (Copayment waived if referred to ER.) Emergency room visit (Inpatient hospital benefits apply if admitted. If held for observation, outpatient benefits apply. See "Inpatient and outpatient hospital services.") Ambulance service	<b>Urgent care centers:</b> \$75 copayment, then 20% after deductible <b>Emergency room:</b> \$400 copayment, then 20% after deductible <b>Ambulance service:</b> 20% after deductible	<b>Urgent care centers:</b> \$75 copayment, then 20% after deductible <b>Emergency room:</b> \$400 copayment, then 20% after deductible <b>Ambulance service:</b> 20% after deductible
<b>Inpatient and outpatient hospital services</b>	20% after deductible	30% after deductible
<b>Prescription drugs</b> Up to 30-day supply. 31-60 day supply is two copayments, and 61-90 day supply is three copayments. Infertility, weight loss and sexual dysfunction drugs not covered by the plan.	\$15 for all 30-day prescriptions at Student Health Center regardless of Tier <b>Tier 1:</b> \$20 copayment <b>Tier 2:</b> \$45 copayment <b>Tier 3:</b> \$60 copayment <b>Tier 4:</b> \$120 copayment	Copayment + charge over in-network allowed amount
<b>Mental health and substance use services</b> Office visits Inpatient/outpatient	<b>Office visits:</b> \$10 copayment <b>Inpatient/outpatient:</b> 20% after deductible	<b>Office visits:</b> \$10 copayment <b>Inpatient/outpatient:</b> 30% after deductible
<b>Vision care</b> Preventive eye exam Diagnostic eye exam Lens and frame coverage (Reimbursement up to the benefit period maximum of \$200 for prescribed glasses – lenses and frames – and hard, soft or disposable contact lenses)	<b>Preventive eye exam:</b> No charge <b>Diagnostic eye exam:</b> \$25 copayment, then 20% after deductible	<b>Diagnostic eye exam:</b> \$25 copayment, then 30% after deductible
<b>Other services</b> Skilled nursing facility (60 days per benefit period), home health care, durable medical equipment and hospice, maternity (maternity delivery includes prenatal and post-delivery care), transplants	20% after deductible	30% after deductible

Goal: Estimate a student's expected health costs

- with student blue
- with no health insurance

To do this, we need to estimate:

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## Estimation

Here is some data to help you figure out the probability of various health events:

- Office visits and preventative care visits:
  - In the age group 18 - 44, there were 205.4 office visits per year per 100 people, 65.4 of which were preventative care. A total of 7.7% of the office visits across all age categories were at hospitals. We will count this 7.7% as outpatient hospital visits and not as office visits or preventative care visits. Source: NCHS survey 2016
  - The CDC reports 56.8 million office visits with with mental, behavioral and neuro-developmental disorders as the primary diagnosis, out of 883.7 million office visits total in all age categories. Source: CDC National Center for Health Statistics See Table 14 in Source: CDC National Ambulatory Medical Care Survey
  - In the age group 18 - 24, the average number of office visits per year per person was 2.1 in 2018. Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)
  - In 2018, the average cost per office-based physician visit was \$301. Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality
  - In 2016, the average cost per visit to a primary care physician was \$106 compared to \$103 for an office visit to a NP or PA. Source: Health Care Cost Institute
- Urgent care, ER visits, and Ambulance Rides:
  - The average cost of urgent care visits for common issues is \$156 Source: Annals of Internal Medicine 2009

- Based on the numbers in one study, we can estimate that there are about 4% as many urgent care visits as of ER visits. Source: Health Affairs 2010
- In 2018, adults age 18 - 44 had an average of 0.2 visits to the emergency room per person. Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)
- The average emergency room visit cost in 2018 for a person age 18 - 44 was \$1,156. Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)
- About 11% of people ages 20 - 24 who have ER visits arrive by ambulance. 2012 article on Variations in Ambulance Use in the United States
- An ambulance ride costs \$400-\$1,200. U.S. Agency for Healthcare Research and Quality
- Hospital stays and hospital outpatient visits:
  - Among US adults ages 18 - 44, 94.2% had no overnight hospital stays, 4.6% had 1, 0.6% had 2, and 0.6% had three or more. Source: National Health Interview Survey 2018
  - In 2018, US adults ages 18 - 44 had an average of 0.1 overnight hospital stays per person. Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)
  - In the age group 18 - 44, there were 205.4 office visits per year per 100 people, 65.4 of which were preventative care. A total of 7.7% of the office visits across all age categories were at hospitals. We will count this 7.7% as outpatient hospital visits and not as office visits or preventative care visits. Source: NCHS survey 2016
  - The average cost for a hospital stay in 2018 for a person age 18 - 44 was \$13876. Source: Medical

Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)

- The average cost of a hospital outpatient visit in 2018 for a person age 18 - 44 was \$1616 Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)
- Mental health inpatient and outpatient treatment:
  - The number of adults age 18 - 64 in hospital inpatient mental health settings in 2018 was 88,552. An additional 27,552 were in non-hospital residential treatment centers and 2,202,583 were in outpatient treatment. National Mental Health Survey Table 3.1. There were 192.74 million adults in this age category in 2018 according to Source: Statista (Need to check if this includes substance abuse stays, for now we will assume yes.)
  - The cost of a substance abuse stay was between \$4082 on average for alcohol and \$4271 on average for other substances in 2006 dollars and the cost of a mental health residential stay ranged between \$4177 and \$7802 on average, depending on diagnosis in 2006. Using a medical inflation calculator, the equivalent costs would be \$6300 - \$6590 for substance abuse and \$6450 - \$12040 in 2020 dollars. Source Pubmed 2012 article *An examination of costs, charges, and payments for inpatient psychiatric treatment*
  - The average cost for outpatient mental health treatment is \$2,000 - \$7,000, according to Source: Oxford Treatment Center. Note: need better source! This source is not necessarily reputable and is not referenced.
  - The CDC reports 56.8 million office visits with with mental, behavioral and neuro-developmental disorders as the primary diagnosis, out of 883.7 million office visits total in all age categories. Source: CDC National Center for Health Statistics See Table 14 in Source: CDC National Ambulatory Medical Care Survey

- Prescription drugs and eye care:
  - Based on 2018 data, 49.3% of US adults age 18 - 44 use prescription drugs. Of all US adults age 18 - 44, the average number of prescriptions filled annually is 5, and the average cost is \$149 per prescription, and the average annual cost per person is \$747. However, these averages include the 0 prescriptions and \$0 for the US adults age 18 - 44 who don't use prescription drugs in a given year. The average cost per person with an expense is \$1516. Source: Medical Expenditure Panel Survey from the Agency for Healthcare Research and Quality (updated)
  - About 53.4% of adults age 18 - 34 wear glasses. Source: Statista
  - Lenses plus frames costs \$240. AllAboutVision
  - Eye exams cost \$163 on average. AllAboutVision

In groups, fill out as much of the costs and frequencies column as possible on the health insurance tab.

What assumptions are we making that may not be correct?



## **Expected costs**

In groups, calculate expected costs for a student with Student Blue insurance and with no insurance. For simplicity, ignore the deductible.

How could we correct our calculation to account for the deductible?

Is it cheaper to not be insured?

Is this a surprise?

Is UNC ripping you off?

Suppose you do an expected value calculation and decide that you will expect to spend more money if you buy the health insurance plan than if you don't. Does this necessarily mean it is a bad idea to buy the health insurance plan? What would be a reason for getting it anyway?