

# Reducing the Cost of Youth Risk

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## Identification & Intervention: Getting Results With RAAPS

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A discussion of public health costs across 6 key adolescent risk factors—and the savings that can be achieved through the utilization of RAAPS, a standardized, validated risk identification and intervention tool.





## About RAAPS

**What is RAAPS?** Developed by researchers and clinicians at the University of Michigan, the **Rapid Adolescent Prevention Screening® (RAAPS)** is a standardized, validated risk identification and coaching solution that supports professionals in reducing risk factors impacting the health, well-being, and academic success of youth. RAAPS has been recognized by leading health organizations and is used to screen over 45,000 youth annually in medical practices, school-based health centers, schools, and other community-based organizations across the United States.

**Why RAAPS?** The health and financial costs of risk are high. 75% of the primary causes of premature death and injury in the youth population are avoidable.<sup>1</sup> **RAAPS helps identify and reduce risk through:**

- 1. Assessment:** comprehensive screening tools tailored by age for the most relevant risks, reading level, and brain development
- 2. Discussion:** health coaching prompts, based on behavior change methodology shown to be most effective at reducing youth risk
- 3. Results:** real-time reporting to track everything from risk factors and outcomes at the individual level to risk trends and needs across an entire youth population

## The RAAPS Mission

Simply stated, RAAPS was created to identify and reduce youth risk to save lives. While the purpose of this report is to detail and discuss the cost savings that can be achieved when risks are addressed – **our ultimate mission is to support professionals in improving the health, well-being, and success of our nation's youth.**



# About the RAAPS Study

## RAAPS 2019 Survey Responses

Risk data includes RAAPS surveys completed by youth in 2019. Improvement rates were calculated for youth completing an initial baseline survey and a follow-up survey (administered 6 - 15 months following their baseline).

42,630 youth completed RAAPS surveys across 338 healthcare, school, and other youth serving settings.

## Observations

In this paper, we will observe and discuss:

- ***Risk behavior incidence within the RAAPS population***
- ***Comparison with behaviors across the U.S. population***
- ***Risk behavior reduction with RAAPS intervention<sup>2</sup>***
- ***Economic impact on public health***

## Risk Categories

The following six key risk categories and associated costs will be discussed:

1. **Helmet Use**
2. **Seatbelt Use**
3. **Unprotected Sex (Teenage Pregnancy, STIs)**
4. **Obesity (Healthful Eating & Physical Activity)**
5. **Suicide**
6. **Substance Abuse (Alcohol Use, Nicotine and Tobacco Use)**





# Six Key Youth Risks & Associated Costs

## HELMET USE

**Potential annual costs of no helmet use in RAAPS population: \$795,700**

Infrequent helmet use while rollerblading, bicycling, skateboarding, skiing, snowboarding, or riding a motorcycle or snowmobile was the top risk factor identified within our RAAPS population. **57% of RAAPS responders (16,267 youth) indicated that they did not regularly wear a helmet.**

Based on 2015 and 2017 data from the National Highway Traffic Safety Administration (NHTSA), we expect the following fatality and injury rates for youth who do not wear helmets:

## RAAPS Helmet Use IMPROVEMENT

- ✓ **57% youth initially at risk**
- ✓ **42% of identified at risk youth reported improvement** following RAAPS intervention

**\$334,194 Saved** in healthcare costs

**U.S. Youth Cyclist Fatality & Injury Rates in 2017**

Age Group	Fatality Rate per 1 million resident population <sup>3</sup>	Injury Rate per 1 million resident population <sup>4</sup>
10-14	1.68	201
15-19	2.27	256
20-24	1.49	217
Average Rates	1.81	224.6

These data suggest an average of 1.81 fatalities/1,000,000 people and 224.6 injuries/1,000,000 people. **Applying these rates to our 16,267 non-helmet wearers, we might expect 0.029 fatalities and 3.65 injuries within the RAAPS population.**

According to the CDC, universal bicycle helmet use by children ages 4 to 15 would prevent up to 45,000 head injuries and up to 55,000 scalp and face injuries each year.<sup>5</sup> Bicycle helmets, when used properly, can reduce overall head injuries by approximately 60% and can reduce fatalities by approximately 73%.<sup>6</sup> Bicycle-related head injuries are expensive because they can require long-term treatment. Fatal and non-fatal crash-related injuries to bicyclists resulted in lifetime medical costs and productivity losses of \$10 billion in 2010.

The total annual cost of traffic-related bicyclist death and injury among children ages 14 and under is more than \$2.2 billion. Error! Bookmark not defined. It has been estimated that if 85% of all child cyclists wore bicycle helmets in one year, the lifetime medical cost savings could total between \$109 million and \$142 million. Error! Bookmark not defined.



## Helmet Use, continued...

As a case example, considering non-fatal injuries alone, medical treatment among children aged 14 and under in Washington State costs more than \$113 million each year, an average of \$218,000 per injured child annually.<sup>7</sup> **Looking at our 3.65 injured non-helmet wearers, this would total \$795,700 in medical costs in one year that can be reduced through risk identification and intervention.**

## SEATBELT USE

**Potential annual costs of no seatbelt use in RAAPS population: \$943,637**

Seatbelts, when used appropriately, reduce the risk of fatal injury to front-seat-passenger car occupants by 45% and the risk of moderate to critical injury by 50%.<sup>8</sup> **10% of RAAPS responders (4,283 youth) indicated that they did not regularly wear seat belts.** This percentage is comparable to the 2019 national average of 9.3% non-seatbelt wearers as reported by the NHTSA.<sup>9</sup>

**Motor vehicle crashes are the leading cause of death for U.S. teens,<sup>10</sup>** so it is crucial to support efforts to increase seatbelt usage. In the U.S. young adult drivers and passengers (ages 18-24) have the highest crash-related non-fatal injury rates of all adults,<sup>11</sup> and teenagers have the lowest rate of seatbelt use of any age group.<sup>12</sup>

In 2017, 2,364 teens in the United States ages 16-19 were killed in motor vehicle crashes and around 300,000 were treated in emergency departments for injuries suffered in motor vehicle crashes.<sup>13</sup> At least 46% of teen drivers and passengers, or 1,087 teens, who died in passenger vehicle crashes in 2017 were not wearing a seat belt at the time of the crash.<sup>13</sup>

Of the total U.S. population of approximately 325 million in 2017,<sup>14</sup> 6.5% or 21,125,000 were ages 15-19.<sup>13</sup> This means that 0.005% of teens, aged 15- to 19, were killed in motor vehicle crashes while not wearing a seatbelt, and 1.42% of the population of young adults were treated for injuries suffered in motor vehicle crashes. **Applying these rates to our RAAPS population of 4,283 non-seatbelt users, we might expect 0.21 fatalities and 61 emergency room-treated injuries.**

### RAAPS Seatbelt Use IMPROVEMENT

- ✓ 10% youth initially at risk
- ✓ 52% of identified at risk youth reported improvement following RAAPS intervention

**\$490,691 Saved**  
in healthcare costs



### Seatbelt Use, continued...

Motor vehicle injuries, both fatal and nonfatal, among young people in this age group represent about \$13.1 billion, or almost 8%, of the total costs of motor vehicle injuries.<sup>13</sup> According to the CDC injury reports calculator, the medical cost per fatality of a 15- to 19-year-old occupant in a motor vehicle crash in 2010 was \$7,685<sup>15</sup>. In 2013, the average auto liability claim for bodily injury was \$15,443.<sup>38</sup>

***If we apply these costs to our RAAPS population, this would translate to \$1,614 in medical costs for our projected 0.21 fatalities and \$942,023 for our projected 61 bodily injuries, for a combined total of \$943,637 that can be reduced through risk identification and intervention.***

## UNPROTECTED SEX

**30% of sexually active RAAPS responders (4,521 youth) reported that they do not always use a condom or another method of birth control to prevent sexually transmitted infections and pregnancy.** This is comparable to the 46% of sexually active high school students nationwide who reported that they did not use condom the last time they had sex.<sup>16</sup>

### Teenage Pregnancy

**Potential annual costs of teen pregnancy in RAAPS population:  
\$1,872,682**

The national pregnancy rate for females age 15-19 is 4.3%.<sup>17</sup> The average cost of a publicly funded unintended pregnancy is \$9,653.<sup>18</sup>

***In our RAAPS population size, this would translate to approximately 194 unintended pregnancies and \$1,872,682 in public funds that can be reduced through risk identification and intervention.***

### Sexually Transmitted Diseases & Infections (STIs)

**Potential lifetime costs of STIs in RAAPS population: \$1,240,396**

**Potential annual costs of STIs in RAAPS population\*: \$19,689**

\*assuming an average "lifetime" of 63 years, i.e. living with an STI from age 15 to age 78

### RAAPS Unprotected Sex IMPROVEMENT

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- ✓ **30% youth initially at risk**
- ✓ **58% of identified at risk youth reported improvement** following RAAPS intervention

**\$1,097,757 Saved**  
in healthcare costs

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## STIs, continued...

15- to 24-year-olds acquire half of all new STDs,<sup>19</sup> and 1 in 4 sexually active adolescent females has an STD.<sup>20</sup> A 2013 CDC analysis reported a 49% incidence of STIs among young men and a 51% incidence among young women ages 15-24.<sup>21</sup> 13- to 24-year-olds accounted for 21% of all new HIV diagnoses in the USA in 2018.<sup>22</sup>

The CDC estimates that STDs cost the US healthcare system \$16 billion annually.<sup>23</sup> As of data from 2000, 15- to 24-year-olds accounted for more than 9 million STD cases with a lifetime medical cost of \$6.5 billion or a lifetime medical cost per person of approximately \$722.<sup>24</sup>

***If we estimate that 25-51% of our 4,521 RAAPS respondents—or 1,130 to 2,306 respondents for this category—develop an STI in their lifetime, we are looking at lifetime medical costs ranging from \$815,860 to \$1,664,932 (\$1,240,396 average).***

## OBESITY

### Healthy Eating & Exercise

**Potential annual costs of obesity in RAAPS population:  
\$28,215,000**

***17% of RAAPS responders (7,206 youth) indicated they do not regularly exercise for one hour on at least 3 or more days weekly.***

***17% of RAAPS responders (7,214 youth) indicated they do not eat fruits and vegetables daily.***

Nationwide, fewer than 1 in 10 children and adults eat the recommended daily amount of vegetables, and only 50% of adults get the physical activity needed to reduce the risk of chronic diseases.<sup>25</sup> Furthermore, obesity prevalence among 12- to 19-year-olds is 20.6%.<sup>26</sup>

Annual healthcare expenses for an obese child are estimated at \$19,000.<sup>27</sup> If we average 7,206 and 7,214 and multiply by the obesity prevalence for young adults aged 12-19, then ***1,485 of our RAAPS respondents may be at risk for obesity. This equates to the potential for \$28,215,000 in total annual obesity-related healthcare expenses that can be reduced through risk identification and intervention.***

### RAAPS Obesity Risk IMPROVEMENT

- ✓ 17% youth initially at risk
- ✓ 48% of identified at risk youth reported improvement following RAAPS intervention

**\$13,543,200 Saved**  
in healthcare costs



## SUICIDE

**Potential annual costs of suicide in RAAPS population:  
\$17,810**

**8% of RAAPS responders (3,545 youth) reported having suicidal thoughts or thoughts of self-harm in the last 12 months.** Suicide is the third leading cause of death among 15- to 19-year-olds.<sup>28</sup> In 2016, the suicide rate for 13- to 19-year-olds was 8.31 per 100,000 individuals.<sup>15</sup>

**Applying this rate to our RAAPS respondents, we may observe a suicide or suicide attempt rate of 0.295 cases.**

When a teen takes their own life, the personal cost to friends and family is immeasurable. We keep this in mind as we observe the financial costs. A 2015 study entitled *Suicide and Suicidal Attempts in the United States: Costs and Policy Implications* states that the average cost of a suicide in the age group of 15- to 24-year-olds in 2013 was \$2,012,476 – with 97% of this cost related to lost productivity and 3%, or \$60,374, related to medical costs.<sup>39,40</sup>

**Applying these costs to our RAAPS population, we might expect medical fees of \$17,810 that can be reduced through risk identification and intervention...and even more importantly, priceless teen lives saved.**

### RAAPS Suicide Risk IMPROVEMENT

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- ✓ **8% youth initially at risk**
- ✓ **45% of identified at risk youth reported improvement** following RAAPS intervention

**\$8,015 Saved**  
in healthcare costs

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## SUBSTANCE ABUSE

### Alcohol Use

**Potential annual costs of alcohol use in RAAPS population:  
\$2,132,510**

**9% of RAAPS responders (3,986 youth) reported drinking more than a few sips of alcohol in the last three months.**

The CDC reported that excessive drinking among underage youth was responsible for more than 4,300 deaths in underage youth and cost the U.S. \$24 billion in 2010.<sup>29</sup> In 2013, there were 119,000 emergency room visits by 12- to 21-year-olds for injuries and other conditions linked to alcohol.<sup>29</sup>

### RAAPS Substance Use IMPROVEMENT

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- ✓ **10% youth initially at risk**
- ✓ **43% of identified at risk youth reported improvement** following RAAPS intervention

**\$1,366,369 Saved**  
in healthcare costs

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### Alcohol Use, continued...

In 2015, 7.1 million 12- to 20-year-olds reported drinking more than just a few sips of alcohol in the past month.<sup>30</sup> If we consider the \$3.8 billion in healthcare costs related to underage drinking,<sup>31</sup> we can assume an annual per-person cost of \$535 related to excessive drinking.

***If we apply this cost to our 3,986 RAAPS respondents, we might expect medical fees related to excessive drinking at \$2,132,510 annually that can be reduced through risk identification and intervention.***

**Note:** It is necessary to mention that the medical costs as a result of alcohol apply to a number of different risk areas, including seatbelt use, helmet use, sexual behavior, etc. Alcohol can act as a conduit for other risky behaviors. **Therefore, some of the costs attributed to alcohol use may substantially increase when also accounted for in other categories.**

### Tobacco Use

**Potential annual costs of tobacco use in RAAPS population:  
\$1,371,000**

**11% of RAAPS responders (4,571 youth) reported using any form of tobacco or nicotine in the past 3 months.** Nationwide, 31.2% of high school students and 12.5% of middle school students reported usage of any tobacco product in 2019.<sup>32</sup> Less than 1 in 25 high school students was a daily smoker, in 2018.<sup>33</sup>

Overall in 2018, 4.9 million youth were current tobacco product users, and there were 1.5 million more current adolescent e-cigarette users in 2018 than there were in 2017.<sup>34</sup> In fact, in 2018 e-cigarettes were the most commonly used tobacco product among high school students.<sup>34</sup>

A 2016 study estimated the total economic cost of smoking, accounting for medical care for adults and lost productivity due to premature death and exposure to secondhand smoke, to be \$300 billion annually.<sup>36</sup> If we consider that 40 million U.S. adults smoke cigarettes,<sup>37</sup> we can expect an annual combined medical and productivity cost of \$7,500 per smoking adult. Additionally, there are significant peer effects on smoker cessation—when an individual's peer group has fewer smokers, that individual is less likely to be a smoker<sup>35</sup>.

Medical care alone for smoking adults costs the USA \$170 billion annually or \$4,250 per adult smoker annually.<sup>36</sup> ***If we assume that 1 in 25 high school students is a daily smoker, 182.8 of our RAAPS respondents for this category may be daily smokers who face annual medical costs in total upwards of \$776,900 or total annual combined medical and productivity costs of \$1,371,000 that can be reduced through risk identification and intervention.***



# RAAPS Cost Savings & ROI

## Public Health Cost Savings

Substantial cost savings may be achieved when adolescent risk behaviors are identified and addressed. **With a total potential public health savings of over \$16 million** for the 2019 survey population, RAAPS clearly plays an important role not only in decreasing risky teen behavior but also in greatly reducing public health costs.

## Return on Investment

In terms of RAAPS return on investment (ROI), in 2019 participating organizations paid just over \$200,000, which is but a small fraction of the total potential public health savings. **This points to potential RAAPS ROI upwards of 8,000%**. (In fact, a modest 0.6% reduction in this adolescent population's risky behaviors would cover the cost of the combined license fee.)

**The chart below summarizes potential public health costs – and potential cost savings – for the 338 sites that used RAAPS in 2019 to support 42,630 adolescents.** Note: due to the nature of youth intervention, these numbers are very conservative as annual savings will compound over time.

RAAPS Potential Public Health Cost Savings in 2019			
RAAPS Risk Category	Potential Annual Public Health Costs for RAAPS Population	% No Longer at Risk after RAAPS intervention <sup>2</sup>	Potential Annual Public Health Cost Savings with RAAPS Utilization
Helmets (Non-Use)	- \$795,700	42%	\$334,194
Seatbelts (Non-Use)	- \$943,637	52%	\$490,691
Unprotected Sex (Pregnancy & STIs)	- \$1,892,371	58%	\$1,097,575
Obesity (Diet & Exercise)	- \$28,215,000	48% (average <sup>38</sup> )	\$13,543,200
Suicide	- \$17,810	45%	\$8,015
Substance Abuse (Alcohol & Tobacco)	- \$3,503,510	39% (average <sup>39</sup> )	\$1,366,369
<b>TOTAL POTENTIAL PUBLIC HEALTH COSTS</b>	<b>- \$35,368,028</b>	<b>TOTAL POTENTIAL SAVINGS WITH RAAPS</b>	<b>\$16,840,044</b>



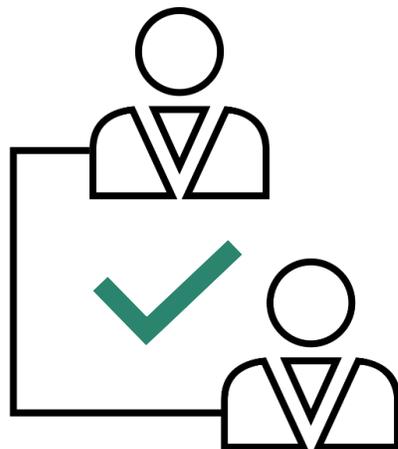
## Conclusions

**RAAPS is an effective, cost-saving intervention to identify and reduce risky youth behaviors.**

By identifying risks and opportunities for intervention, RAAPS additionally provides a ***substantial economic return on investment to the communities in which teens live.***

We believe the value of validated, standardized resources like RAAPS to identify and reduce youth risk goes well beyond the potential medical and public health cost savings.

We're honored to support professionals in perhaps the most critical of public health endeavors – improving the health and wellness of our nation's youth. Together we can save lives.



**Identify. Connect. Prevent Risky Behaviors.**

Visit **[PossibilitiesforChange.org](https://PossibilitiesforChange.org)** to learn more about our mission and how we can help you achieve yours.



## References & Notes

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39. **Note:** 43% no longer at risk for alcohol use and 35% no longer at risk for tobacco use.