



HEALTH FIRST INDIANA EVALUATION

PRELIMINARY REPORT: ESTIMATED COST SAVINGS FROM PRENATAL CARE,
BLOOD PRESSURE SCREENINGS, AND FALL PREVENTION SERVICES

Center for Health Policy
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EXECUTIVE SUMMARY

In 2023, the Indiana General Assembly appropriated \$225 million in new biennium public health funding for fiscal years 2024 and 2025 for the Health First Indiana (HFI) program. Under the HFI initiative, the state disperses funds to local health departments (LHDs), and localities use the HFI funding to provide core public health services. The state dispersed a total of \$75 million in 2024 and will disperse \$150 million in 2025. Before the HFI initiative, counties received a total of about \$7 million from the state annually. The HFI initiative marks a 1,500 percent increase in the state's average annual investment in public health in 2024 and 2025.

The full version of this report, to be published in early 2026, will present an economic evaluation for the HFI investment. Our goals are to:

1. Summarize the number and types of services provided by LHDs and their partners through HFI funds.
2. Estimate the expected cost savings from the HFI investment and calculate a predicted return on investment (ROI).
3. Assess expected changes in Indiana's national rankings in public health investments after the HFI initiative.

This preliminary report, prepared by researchers from the Richard M. Fairbanks School of Public Health at Indiana University Indianapolis, estimates cost savings from three key service areas that LHDs have been able to provide and expand using HFI funds: (1) prenatal care, (2) blood pressure screenings, and (3) fall prevention services. Note that these findings are preliminary, based on data reported by only 89 LHDs from January 2024 through August 2024, and cover only a few of the hundreds of services provided by counties under HFI. Moreover, while the current version of this report incorporates only direct healthcare cost savings and indirect savings incurred from preventing premature mortality, the full version will include additional measures of direct non-healthcare cost savings (e.g., reduced spending on criminal justice system and homeless shelters) and indirect costs (e.g., through reductions in unemployment, workplace productivity losses due to absenteeism and presenteeism, caregiver direct health care, caregiver productivity losses, and missed primary education). Thus, the cost savings estimates provided in this preliminary report should not be interpreted as a comprehensive evaluation of the entire HFI program but rather as a conservative underestimate of the program's impact thus far.

KEY FINDINGS

- Between January and August 2024, HFI-participating LHDs have reported **a total of 581,073 individual services** delivered across the HFI core service areas. Our preliminary analysis shows that **the estimated direct and indirect costs savings attributed to just the first three services examined (prenatal care, blood pressure screenings, and fall prevention) totals \$94,394,667**. This number includes direct healthcare cost savings from disease-related healthcare expenditures and indirect cost savings incurred from preventing premature mortality. It is important to note that for each of these three services examined, there are different time horizons for cost savings estimates, based on the nature of the service and when benefits accrue. For example, prenatal care savings are immediate or short-term (incurred within a year of service delivery), whereas blood pressure screenings have long-term benefits and take individuals' lifetime savings into account. Fall prevention activities yield benefits both immediately and in the medium term, and our estimates account for reduced probability of falls over a 3-year time horizon.
- Indiana's public health spending ranking is expected to **rise from 47 out of 50 states in 2021-22 (before the HFI initiative) to 35 in 2024-25** (after two full years of HFI funding), assuming no changes in other states' spending and that any changes in federal grants are uniform across states.
- Nearly a quarter of pregnant Hoosier women do not receive recommended prenatal care, which is correlated with low birthweight among infants, longer post-birth hospital stays, increased caesarean sections, and higher health care costs. **HFI funds were used to provide (or refer) 11,918 prenatal care services to pregnant women. The literature shows that receiving adequate and timely comprehensive prenatal care reduces healthcare costs by \$4,113 per birth.¹ Assuming these individuals received the full spectrum of prenatal care services, we estimate this will generate \$49,018,734 in direct cost savings.** Since we are unable to determine from the current data if any of these services are being provided to the same individuals, the above direct cost savings is likely an overestimation. These savings primarily stem from reduced health care expenditures associated with caring for low birthweight babies, reduced probability of caesarean section birth, and improved maternal and fetal outcomes.
- Of the 21 LHDs reporting data on the number of Hoosiers screened and found to have undiagnosed high blood pressure, a total of 1,275 individuals were identified with previously undiagnosed high blood pressure. Assuming that 40% of these individuals went on to be treated (based on previously collected data),¹² we estimate that the first 8 months of these **blood pressure screening efforts prevented 9.5 future cardiovascular events and 3.6 future deaths, resulting in lifetime cost savings of \$42,935,227 (including \$452,227 in direct healthcare costs and \$42,483,000 in indirect costs associated with premature mortality).**
- We estimate that fall prevention services provided in the first 8 months of HFI funding will **prevent a total of 77 falls over the next three years, which is associated with total cost savings of \$2,440,706 (including direct cost savings of \$989,858 and indirect cost savings of \$1,450,848).** To the extent that individuals' probability of falling decreases over an even longer time horizon following fall prevention education,^{3,4} we would expect that the services provided in 2024 will yield even more cost savings in the long term.

Table 1. Health First Indiana Core Public Health Areas (January-August 2024)

| Core Public Health Area | Number of Individual Services Delivered Statewide |
|---|--|
| Access and Linkage to Clinical Care | 23,367 |
| Child and Adult Immunizations | 59,446 |
| Childhood Lead Screening and Case Management | 11,517 |
| Chronic Disease Prevention and Reduction | 40,998 |
| Emergency Preparedness | 8,344 |
| Fatality Review (Child, Infant, Fetal, Suicide, Overdose) | 16,083 |
| Infectious Disease Prevention and Control | 77,971 |
| Maternal and Child Health | 70,262 |
| Student Health/School Health Liaison | 140,040 |
| Tobacco Prevention and Cessation | 32,750 |
| Trauma and Injury Prevention and Education | 59,549 |
| Tuberculosis (TB) Prevention and Case Management | 40,746 |
| Total | 581,073 |

INTRODUCTION

HFI strengthens the state-local partnership and overall public health infrastructure for Indiana. The state health department provides funds, and local health departments (LHDs) are expected to ensure the provision of services in 15 core public health areas. (Table 1 lists the core public health areas for which data are available so far. It also provides the number of services delivered by core public health area.) Statutory requirements tied to HFI funding requires LHDs track key performance indicators for the core areas and report them to IDOH. In 2024, 89 local health departments opted to receive HFI funds, and by 2025, all 95 local health departments in the state will participate. Between January and August 2024, LHDs have reported a total of 581,073 individual services delivered across the HFI core service areas.

A robust evidence base supports the notion that preventing ill health through public health investments is financially preferable to subsequently treating health conditions. Studies show that returns on investment (ROI) for public health are significant and are, on average, 14.3

to 1.⁵ Thus, there is reason to expect future cost savings from the investments that the state is making today in public health. The purpose of this report is to estimate these future cost savings using rigorous economic evaluation methods.

METHODOLOGY

Our general methodology involves a three-step approach. First, using the activity tracker files for LHDs, we identified approximately 200 unique services that LHDs reported HFI funds provided. For each of these services, we first aggregated the number of services provided across LHDs to obtain a statewide sum for each of these services. We estimated cost savings separately for each service because it is not a given that each of these services will save costs.

Second, we conducted a comprehensive literature review to identify health outcomes and cost savings associated with each of these services. Wherever possible, we restricted our search to the most rigorous, peer-reviewed studies that used experimental or quasi-experimental methods to identify true causal effects of providing these

services (as opposed to simple correlations that may be inflated due to confounders, reverse causality, and other biases). In cases where there were multiple studies providing evidence on cost savings associated with the service, we selected an appropriate study based on (1) how closely the study intervention matched the HFI services reported by LHDs, (2) strength of the study design (meta-analyses of randomized controlled trials were our gold standard), (3) recency of the study, and (4) whether the study was conducted in the United States or similar developed country context. Our inclusion and exclusion criteria for studies was based on study methodology and not on the study findings. We included studies that reported positive impacts of these services on outcomes, negative impacts, and null (zero) impacts, so long as the study methods were rigorous.

Third, we extrapolated expected cost savings for each service using the total number of services provided in Indiana and the expected cost savings associated with each service. All reported dollar estimates are adjusted for inflation and presented in 2024 dollars. In calculating these cost saving estimates, we made several key decisions presented below.

(1) First, as is often the case with public health investments or other financial investments, the HFI funds are being dispersed in the present, but any potential benefits will accrue in the present as well as the future. A challenge we faced was that the studies we identified for this analysis were conducted in different settings and thus considered data from different time horizons. For example, there is strong evidence that a senior citizen who receives fall prevention education has a reduced probability of falling in the three-year period following the education service. For other services, like prenatal care, we see the impact more in the immediate future. And for still other services, like exercise promotion, the benefit may not accrue until many years following the

service. We handle this limitation by synthesizing whatever literature exists for a given service and providing cost savings estimates across the longest time horizon for which there is strong evidence. This means that the time horizons assessed are different for each service. We specifically denote the time horizon considered for each service in that respective section.

(2) The health conditions that HFI seeks to prevent pose both direct costs (in the form of healthcare spending) and indirect costs (in the form of lost workplace productivity, pressure on informal caregivers, and value of human life). We found that while there is ample evidence for direct cost savings associated with these services, there is less research on the indirect cost savings for many of these services. We included data on indirect costs wherever we found robust evidence, and our results distinguish between direct cost savings and indirect cost savings. For services that were found to reduce deaths, we calculated savings associated with saved lives using the Environmental Protection Agency (EPA)'s value of statistical life (VSL) measure.⁶

(3) While the services being provided are being paid for by a single source (HFI funds), cost savings accrue to multiple stakeholders, including individual Hoosiers, private insurance companies, public insurers (such as Medicare and Medicaid), employers (in the form of increased workplace productivity), and other government departments (e.g., reduced criminal justice expenses associated with certain services). The literature that we drew from did not always identify whom the cost savings accrued to, so for simplicity, we did not attempt to differentiate between various stakeholders but rather presented an aggregate measure of expected cost savings.

(4) Some studies reported outcomes in terms of changes in incidence ratio, relative risk, etc.

For consistency, we converted all effect sizes to changes in probability of the outcome and used incidence data for the state to estimate changes in outcomes.

Our detailed methodology for each group of services is presented in the main report below.

LIMITATIONS

We are not able to capture some indirect impacts of the HFI investment that are difficult to quantify, such as future business investments that our state may experience from having a healthy, robust workforce. We also note another important limitation, which is that not all these services have been rigorously studied. Even those that have been rigorously studied have not always been assessed over a longer time horizon. The absence of evidence does not imply that these services have no benefit, but rather that they have not been studied rigorously yet. We point out services for which there is little evidence and acknowledge that this means that the estimates presented in this report are likely conservative underestimates of the true impact of HFI.

Some additional limitations of this preliminary report include that our analysis is based on data reported by only 89 LHDs from January 2024 through August 2024 and cover only a few of the hundreds of services provided by counties under HFI. Moreover, while the current version of this report incorporates only direct healthcare cost savings and indirect savings incurred from preventing premature mortality, the final version will include additional measures of direct non-healthcare cost savings (e.g., reduced spending on criminal justice system and homeless shelters) and indirect costs (e.g., through reductions in unemployment, workplace productivity losses due to absenteeism and presenteeism, caregiver direct health care, caregiver productivity losses, and missed primary education). **Thus, the cost savings**

estimates provided in this preliminary report should not be interpreted as a comprehensive evaluation of the entire HFI program but rather as a conservative underestimate of the program's impact thus far.

INDIANA'S RANKING IN PUBLIC HEALTH SPENDING

For decades, Indiana ranked low in per capita public health investments. In contrast to most other US states, where state-level funds predominantly support local public health services, Indiana has historically had a decentralized public health funding structure. LHDs relied primarily on local funds, often property taxes, to support nearly 70 percent of public health activities and services within their jurisdiction.⁷ Most LHDs in the state are small and face significant budgetary constraints. Based on pre-HFI data from 2021-22 from the Centers for Disease Control and Prevention (CDC), Health Resources and Services Administration (HRSA), and Trust for America's Health, Indiana ranked 47 out of 50 US states in terms of state public health funding per person (including federal grants directed at states from CDC and HRSA).⁸

Indiana's population in 2022 was approximately 6,832,000. The America's Health Rankings report cited above reports a 2-year estimate of Indiana's state dollars dedicated to public health per person (including federal grants directed to states from the CDC and HRSA) in 2021-22 of \$135 per person. By multiplying 6,832,000 (Indiana's population at the time) by \$135 (2-year estimate of per-person public health spending), we estimate that in 2021-22, Indiana spent \$926,370,000 on public health (including federal grants). Assuming no change in the receipt of federal grants, the HFI investment of an additional \$225,000,000 means that we expect 2024-2025 total spending to be \$1,151,370,000 (the sum of \$926,370,000 and \$225,000,000).

Using the most recent population estimate of 6,862,000 Hoosiers, this implies an average per-person spending of \$168 over the 2024-25 period (\$1,151,370,000 divided by 6,862,000). Assuming that there are no changes in public health spending in other US states and that any changes in federal grants are uniform across states, **we expect Indiana’s rank in public health spending to rise to 35 for the 2024-25 period.** Note that if other states in the bottom half of the rankings also increase their public health spending or if these states receive more federal grants in 2024-25 than Indiana, we expect Indiana’s improvement to be smaller than what’s presented in this report.

PRENATAL CARE

Indiana has worse maternal and child health outcomes than the nation overall and most other states in our region.⁹ Indiana’s maternal mortality rate is 35% higher and infant mortality rate is 28% higher than the nation overall. Meanwhile, only 75% of Hoosier women receive prenatal care starting in their first trimester, as recommended

by the American College of Obstetricians and Gynecologists. Another 18% wait until the second trimester to initiate prenatal care, and nearly 7% receive later or no prenatal care at all.¹⁰ This is concerning because early and consistent prenatal care can help prevent and manage complications during pregnancy, childbirth, and the postpartum period. For example, prenatal visits allow healthcare providers to monitor for complications like gestational diabetes, high blood pressure (hypertension), preeclampsia, and infections. Early detection of these conditions can lead to timely interventions that prevent severe outcomes.

There is strong evidence from multiple rigorous randomized controlled trials that prenatal education reduces the risk of caesarean birth as well as epidural anesthesia,¹¹ improves maternal mental health,¹¹ reduces the fear of childbirth,¹² decreases reported pain intensity during labor,¹² and decreases postpartum depression. Numerous studies have also found links between prenatal care and reductions in preterm birth, as providers can monitor fetal development,

Table 2. Estimated Cost Savings for Prenatal Care Services (January-August 2024)

| Service | Total Number of Services Provided Statewide | Total Estimated Cost Savings | Justification |
|---|--|--|--|
| Number of women provided prenatal services (including clinical care, chlamydia testing, gonorrhea testing, HIV testing, Hepatitis C testing, immunizations, mental health/SUD services, nutrition education, nutrition support, syphilis testing, vitamins, or other prenatal services; Number of women referred to prenatal care | 11,918 (10,752 prenatal care services provided plus 1,166 referred to prenatal care) | \$49,018,734 | Compared with no prenatal care, receiving any prenatal care generates direct health care cost savings of \$3,473 to \$4,7531 (inflated to 2024 dollars from original values reported in study). We took the midpoint of this range (\$4,113) and multiplied it by the estimated number of prenatal services (11,918) provided to obtain direct cost savings of \$49,018,734. ¹⁴ |
| Total | | Total Direct: \$49,018,734 Time Horizon: Incurred within a year of service delivery | |

screen for conditions that increase the risk of preterm birth (such as infections or cervical insufficiency), and take preventive actions (e.g., prescribing progesterone or recommending bed rest). Even after accounting for important unobserved differences in women who do and do not receive prenatal care, quasi-experimental studies have found that initiating timely prenatal care in the first trimester reduces the probability of fetal death by 25% and reduces the probability of low birth weight by 7%.¹³

Table 2 presents cost savings estimates associated with prenatal care services that LHDs were able to provide using HFI funds. HFI funds were used to provide 10,752 prenatal care services, refer 1,166 women to prenatal care, refer 495 women to online education through MyHealthyBaby, provide 278 pregnant women mental health/substance use disorder (SUD) services, and refer 350 pregnant women to mental health/SUD services. In this preliminary report, we provide cost savings estimates for the first two of these services (prenatal care services provision and prenatal care referrals). **The literature shows that receiving adequate and timely comprehensive prenatal care reduces healthcare costs by \$4,113 per birth.¹ Assuming these individuals received the full spectrum of prenatal care services, we estimate this will generate \$49,018,734 in direct cost savings.** Since we are unable to determine from the current data if any of these services are being provided to the same individuals, the above direct cost savings is likely an overestimation.

BLOOD PRESSURE SCREENINGS

Hypertension is a silent condition. Nearly 15% of those with hypertension do not know that their blood pressure is too high and are not receiving treatment to control it.¹⁵ This is concerning

because hypertension is a leading risk factor for many serious and costly health conditions, such as heart attack, stroke, heart failure, kidney disease, and vision loss. Studies indicate that identifying people with undiagnosed hypertension can significantly help in saving healthcare costs and that anti-hypertension treatments are generally cheap and highly cost-effective.¹⁶ By identifying individuals with undiagnosed hypertension early, healthcare providers can intervene before these conditions develop or worsen. Treatment of hypertension with medications, lifestyle changes, and regular monitoring helps prevent costly and debilitating complications. The cost of managing a stroke, heart attack, or kidney failure - which often result in emergency room visits, hospitalizations, surgeries, and long-term rehabilitation - is far greater than the cost of diagnosing and treating hypertension early.

Identifying and treating hypertension also generates significant productivity gains. Hypertension is linked to chronic fatigue, mental health issues, and decreased productivity, which can lead to absenteeism from work and a loss of income for individuals. By diagnosing and managing hypertension early, individuals can remain healthier, more productive, and less likely to miss work due to health-related issues, which benefits both the economy and employers. Reduced absenteeism can also decrease the overall economic burden caused by lost productivity.

Many LHDs are using HFI funds to address the issue of undiagnosed hypertension among Hoosiers. Through services like blood pressure screenings conducted by LHDs or community partners, 1,275 Hoosiers were identified with undiagnosed high blood pressure between January and August 2024. **Table 3** shows that these **blood pressure screening efforts prevented 9.5 future cardiovascular events**

Table 3. Estimated Cost Savings for Cardiovascular Screenings (January-August 2024)

| Service | Total Number of Services Provided Statewide | Total Estimated Cost Savings | Justification |
|--|---|--|--|
| Number of people identified with undiagnosed high blood pressure through local health department or partners | 1,214 | Direct: \$430,497 Indirect: \$40,460,000 | <p>We assume that 40% of those identified with hypertension will follow-up with a physician and receive treatment (based on a meta-analysis),² meaning that 485.6 individuals are now being treated for their previously unknown hypertension (0.4 times 1,214).</p> <p>Cardiovascular Disease Policy Model simulations show that for every 860,000 people with existing hypertension and cardiovascular disease who are not being treated currently, treatment would prevent 16,000 cardiovascular events and 6,000 deaths.¹⁷ From these numbers, we can extrapolate that treatment for hypertension reduces the probability of a cardiovascular event by 0.0186 (16,000 divided by 860,000) and of a death by 0.007 (6,000 divided by 860,000). So among the 485.6 individuals who are now being treated for their hypertension, 9 cardiovascular events (485.6 times 0.0186) and 3.4 deaths (485.6 times 0.7) have been averted.</p> <p>A cardiovascular event costs on average \$47,833 to treat,¹⁷ which implies direct health care cost savings of \$430,497 (9 times \$47,833).</p> <p>Using the EPA's VSL measure of \$11.9 million, 3.4 deaths averted implies a \$40,460,000 indirect cost saving (3.4 times \$11.9 million).</p> |
| Additional number of people identified with high blood pressure based on imputation | 61.1 | Direct: \$21,730 Indirect: \$2,023,000 | <p>Some LHDs reported conducting blood pressure screenings but did not submit data on the screening results. Data from those LHDs that reported both blood pressure screenings and identified cases of undiagnosed high blood pressure show that approximately 14.4% of Hoosiers served by these activities had undiagnosed high blood pressure. Applying this number to those LHDs that conducted screenings but did not report results of the screenings, we estimate an additional 61.1 cases of identifying undiagnosed high blood pressure (0.144 times 424 blood pressure screenings in LHDs that did not report cases of undiagnosed high blood pressure identified).</p> <p>Using the studies cited above, 24.4 of these individuals will receive follow-up care (0.4 times 61.1), which will avert 0.46 cardiovascular events (24.4 times 0.0186) and 0.17 deaths (24.4 times 0.007). This is equivalent to direct healthcare cost savings of \$22,003 (0.46 times \$47,833) and indirect cost savings of \$2,007,530 (0.17 times \$11.9 million).</p> |
| Total | | Direct: \$452,227 Indirect: \$42,483,000 Total: \$42,935,227 Time Horizon: Lifetime | |

and 3.6 future deaths, resulting in lifetime cost savings of \$42,935,227 (including \$452,227 in direct healthcare costs and \$42,483,000 in indirect costs associated with premature mortality).

Due to lack of data on cost savings from the literature, we are not able to provide estimates for other cardiovascular awareness services provided under the HFI initiative, such as billboards to recommend blood pressure screenings or social media campaigns promoting cardiovascular health.

FALL PREVENTION

Falls are of concern, particularly among senior citizens. According to the CDC, there were 311,506 falls among those over 65 in Indiana in 2020, the most recent year for which comprehensive fall data are available. In the same year, there were 499 fall-related deaths among seniors.¹⁸

Fall prevention education programs can be effective in reducing falls, particularly in older adults or those with risk factors for falling. These programs generally aim to educate individuals about fall risks and how to take proactive measures to prevent falls. However, the effectiveness of these programs can vary depending on how they are implemented, the target population, and whether the programs address all the relevant risk factors for falls. For example, programs that focus only on education without a practical element (like exercise) may be less effective than those that incorporate a multi-faceted approach.

Some LHDs spent HFI funding on activities related to fall prevention, including education in fall prevention and home remedies for fall risks. We estimate that fall prevention services provided in the first 8 months of HFI funding will prevent a total of 77 falls over the next three years, which is associated with total cost

savings of \$2,440,706 (including direct cost savings of \$989,858 and indirect cost savings of \$1,450,848). To the extent that individuals' probability of falling decreases over an even longer time horizon following fall prevention education,^{3,4} we would expect that the services provided in 2024 will yield even more cost savings in the long term. **Table 4** explains the provenance of these numbers.

It is noteworthy that a substantial portion of the direct cost savings associated with fall prevention will accrue to public payers, such as Medicare and Medicaid. Non-fatal falls among seniors make up for 6% of Medicare spending and 8% of Medicaid spending.¹⁹

Falls are associated with numerous other indirect costs, which we are unable to account for due to a paucity of rigorous evidence. For example, 37% of seniors who report a fall are injured severely enough that their activities are restricted. This means lost workplace productivity (for those who are still working) and additional formal or informal caregiving needs, which puts stress on family caregivers.

Table 4. Estimated Cost Savings for Fall Prevention Services (January-August 2024)

| Service | Total Number of Services Provided Statewide | Total Estimated Cost Savings | Justification |
|---|---|---|--|
| Number of seniors participating in activities related to fall prevention | 432 | Direct: \$333,372 Indirect: \$476,000 | <p>A meta-analysis of 17 randomized controlled trials showed that multifactorial fall prevention interventions reduce the incidence rate of falls by 21% in the 6-36 month period following the intervention.⁴</p> <p>We estimate the probability of experiencing a fall among the elderly (age 65 and older) population in Indiana to be 0.286 (311,506 falls among people age 65 and older in 2020¹⁸ divided by 2020 elderly population of 1,089,814²⁰). A 21% reduction implies that the probability of falling decreases by 0.06, which would bring the probability of falling to 0.226.</p> <p>This implies that 123.6 of the 432 Indiana seniors who received this service would have fallen in the absence of the service (0.286 times 432), but this number decreased to 97.6 due to the service (0.226 times 432). In other words, the HFI investment prevented 26 falls (123.6 minus 97.6).</p> <p>The average direct cost of a fall is \$33,944 for a fatal fall and \$12,789 for a non-fatal fall.²¹ (These dollar values were originally reported in 2015 dollars, and we adjusted to 2024 dollars.) Given that 0.16% of falls in Indiana are fatal (499 divided by 311,506), the weighted average cost of a fall is \$12,822 (0.0016 times \$33,984 plus 0.9984 times \$12,789). Thus, the direct cost savings of 26 prevented falls is \$333,372 (26 times \$12,822).</p> <p>Since 0.16% of falls are fatal, we expect this service to reduce the number of fall deaths by 0.04 over the next three years (26 times 0.0016). Using the EPA's VSL measure of \$11.9 million, this implies a \$476,000 indirect cost savings (0.04 times \$11.9 million).</p> |
| Number of people educated in fall prevention and home remedied for fall risks | 853 | Direct: \$656,486 Indirect: \$974,848 | <p>Although unspecified in the LHD reported data, we assume that the number of people educated in fall prevention and home remedied for fall risks refers to those over 65.</p> <p>Using the same study cited above, we calculate that 244 of the people who received this service would have fallen in the absence of the service (0.286 times 853), but this number decreased to 192.8 due to the service (0.226 times 853). In other words, the HFI investment prevented 51.2 falls (244 minus 192.8). Using \$12,822 as the average direct cost of a fall as calculated above, the direct cost savings of 51.2 prevented falls is \$656,486 (\$12,822 times 51.2).</p> <p>Since 0.16% of falls are fatal, we expect this service to have reduced the number of fall deaths by 0.082 (51.2 times 0.0016), which implies \$974,848 indirect cost savings (0.082 times \$11.9 million).</p> |
| Total | 1,285 | Direct: \$989,858 Indirect: \$1,450,848 Total: \$2,440,706 Time horizon: 3 years | |



CONCLUSION

This preliminary report, prepared by researchers from the Richard M. Fairbanks School of Public Health at Indiana University Indianapolis, estimates cost savings from three key service areas that LHDs have been able to provide and expand using HFI funds: (1) prenatal care, (2) blood pressure screenings, and (3) fall prevention services. Our preliminary analysis shows that **the estimated direct and indirect costs savings in the first 8 months of this initiative attributed to just these 3 services total \$94,394,667.** Assuming that services remain similar across the final 4 months of the calendar year, the total direct and indirect costs savings for the calendar year are projected to be \$141,592,001. Note that these findings are preliminary, based on data for only 89 LHDs from January 2024 through August 2024, and cover only a few of the hundreds of services provided by counties under HFI. Moreover, while the current version of this report incorporates only direct healthcare cost savings and indirect savings incurred from preventing premature mortality, the full version will include additional measures of direct non-healthcare cost savings (e.g., reduced spending on criminal justice system

and homeless shelters) and indirect costs (e.g., reductions in unemployment, workplace productivity losses due to absenteeism and presenteeism, caregiver direct health care, caregiver productivity losses, and missed primary education). Thus, the cost savings estimates provided in this preliminary report should not be interpreted as a comprehensive evaluation of the entire HFI program but rather as a conservative underestimate of the program's impact thus far.

REFERENCES

1. Hueston WJ, Quattlebaum RG, Benich JJ. How Much Money Can Early Prenatal Care for Teen Pregnancies Save?: A Cost-Benefit Analysis. *J Am Board Fam Med*. 2008;21(3):184-190. doi:10.3122/jabfm.2008.03.070215
2. Fleming S, Atherton H, McCartney D, et al. Self-Screening and Non-Physician Screening for Hypertension in Communities: A Systematic Review. *Am J Hypertens*. 2015;28(11):1316-1324. doi:10.1093/ajh/hpv029
3. Guirguis-Blake JM, Perdue LA, Coppola EL, Bean SI. Interventions to Prevent Falls in Older Adults: An Evidence Update for the U.S. Preventive Services Task Force. Agency for Healthcare Research and Quality (US); 2024. Accessed November 22, 2024. <http://www.ncbi.nlm.nih.gov/books/NBK604238/>
4. Guirguis-Blake JM, Michael YL, Perdue LA, Coppola EL, Beil TL, Thompson JH. *Interventions to Prevent Falls in Community-Dwelling Older Adults: A Systematic Review for the U.S. Preventive Services Task Force*. Agency for Healthcare Research and Quality (US); 2018. Accessed November 22, 2024. <http://www.ncbi.nlm.nih.gov/books/NBK525700/>
5. Masters R, Anwar E, Collins B, Cookson R, Capewell S. *Return on investment of public health interventions: a systematic review*. *J Epidemiol Community Health*. 2017;71(8):827-834. doi:10.1136/jech-2016-208141
6. US EPA O. Mortality Risk Valuation. April 20, 2014. Accessed December 9, 2024. <https://www.epa.gov/environmental-economics/mortality-risk-valuation>
7. Menachemi N, Weaver L, Caine V, Hatchett DS, Box K, Halverson PK. Indiana's Public Health Investment Holds Insights For Other States. *Health Aff (Millwood)*. 2024;43(6):856-863. doi:10.1377/hlthaff.2023.01650
8. United Health Foundation. Public Health Funding in the United States. America's Health Rankings. Accessed December 9, 2024. https://www.americashealthrankings.org/explore/measures/PH_funding
9. Menachemi N, Soni A, Sanner L. Characterizing the Indiana Context: An Update to Understanding Costs of Care in the State. <https://fairbanks.indianapolis.iu.edu/research-centers/centers/health-policy/costs-of-care-indiana.html>
10. Distribution of prenatal care timing categories: Indiana, 2023. March of Dimes | PeriStats. Accessed December 4, 2024. <https://www.marchofdimes.org/peristats/data?top=5&lev=1®=99&sreg=18&slev=4>
11. Hong K, Hwang H, Han H, et al. Perspectives on antenatal education associated with pregnancy outcomes: Systematic review and meta-analysis. *Women Birth*. 2021;34(3):219-230. doi:10.1016/j.wombi.2020.04.002
12. Alizadeh-Dibazari Z, Abdolalipour S, Mirghafourvand M. The effect of prenatal education on fear of childbirth, pain intensity during labour and childbirth experience: a scoping review using systematic approach and meta-analysis. *BMC Pregnancy Childbirth*. 2023;23(1):541. doi:10.1186/s12884-023-05867-0
13. Cygan-Rehm K, Karbownik K. The effects of incentivizing early prenatal care on infant health. *J Health Econ*. 2022;83:102612. doi:10.1016/j.jhealeco.2022.102612

14. Health costs associated with pregnancy, childbirth, and postpartum care. Peterson-KFF Health System Tracker. Accessed December 4, 2024. <https://www.healthsystemtracker.org/brief/health-costs-associated-with-pregnancy-childbirth-and-postpartum-care/>
15. CDC. Million Hearts® Undiagnosed Hypertension. Centers for Disease Control and Prevention. April 27, 2023. Accessed December 9, 2024. <https://millionhearts.hhs.gov/about-million-hearts/optimizing-care/undiagnosed-hypertension.html>
16. Tajeu GS, Tsipas S, Rakotz M, Wozniak G. Cost-Effectiveness of Recommendations From the Surgeon General's Call-to-Action to Control Hypertension. *Am J Hypertens*. 2021;35(3):225-231. doi:10.1093/ajh/hpab162
17. Moran AE, Odden MC, Thanataveerat A, et al. Cost-Effectiveness of Hypertension Therapy According to 2014 Guidelines. *N Engl J Med*. 2015;372(5):447-455. doi:10.1056/NEJMsa1406751
18. CDC. Older Adult Falls Data. Older Adult Fall Prevention. May 9, 2024. Accessed November 22, 2024. <https://www.cdc.gov/falls/data-research/index.html>
19. Florence CS, Bergen G, Atherly A, Burns E, Stevens J, Drake C. Medical Costs of Fatal and Nonfatal Falls in Older Adults. *J Am Geriatr Soc*. 2018;66(4):693-698. doi:10.1111/jgs.15304
20. Population by Age Data Output: STATS Indiana. Accessed December 12, 2024. https://www.stats.indiana.edu/stats_dpage/dpage.asp?id=71&view_number=2&menu_level=&panel_number=
21. Burns ER, Stevens JA, Lee R. The direct costs of fatal and non-fatal falls among older adults — United States. *J Safety Res*. 2016;58:99-103. doi:10.1016/j.jsr.2016.05.001



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