

White Paper

Use Cases for Social Impact Bonds in Schenectady, New York

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I. Summary

Social impact bonds (SIBs) are financial instruments that align incentives in order to finance socially beneficial preventive interventions using capital from profit-seeking private investors. In particular, SIBs introduce exciting opportunities for scaling programs to improve public health. This white paper discusses how SIBs work, and why they are well suited for public health applications; it is written in response to a large community health assessment in Schenectady, New York. The paper proposes four use-cases for SIBs to be piloted in Schenectady that would reduce incidence of asthma, falls among seniors, type 2 diabetes, and tobacco smoking. The paper concludes with a discussion about the future development of SIBs as a new asset class, and recommendations for Schenectady.

II. Introduction

Social impact bonds (SIBs) are an emerging financial instrument for impact investing. SIBs raise capital from profit-seeking private investors in order to fund public interventions; appropriate interventions will produce both social impact and government savings; the performance of the intervention is measured by an independent evaluator; and, if the intervention achieves predetermined performance benchmarks, then governments use the resulting savings to repay investors. By this model, SIBs create opportunities for investors to profit; and, governments only pay for outcomes successfully achieved.

The first SIB ever developed was launched in the United Kingdom in 2010. Since then, others have been piloted. Today, SIBs are being used: to reduce adolescent recidivism in New York City²; to reduce chronic homelessness and to support youth aging out of

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² Bloomberg, M. R. (2012, August 02). *Bringing social impact bonds to New York City*. Retrieved from http://www.nyc.gov/html/om/pdf/2012/sib_media_presentation_080212.pdf

the juvenile justice system in Massachusetts³; to fund early childhood education in Utah⁴; and to improve asthma morbidity in Fresno, California⁵. New SIBs are being developed and implemented throughout the United States, and in other countries.

This white paper describes SIBs, and how they could potentially be used to improve public health in Schenectady, New York. In particular, this paper discusses use cases for SIBs that would scale evidence-based interventions addressing asthma, falls among seniors, type 2 diabetes, and tobacco smoking. Beyond these examples, there are many exciting potential applications for SIBs in public health. I estimate that up to approximately \$50 million in averted medical expenditures and lost productivity could be saved annually by using SIBs in Schenectady to implement the evidence-based interventions that I will outline.

III. The Structure of a Social Impact Bond

A SIB is not actually a bond. A bond is a financial debt instrument in which investors loan money to a bond issuer, and then the issuer repays investor principal at a defined interest rate over a set repayment schedule. In contrast, a SIB is not a debt instrument; it involves a group of contractual partnerships that finance a socially beneficial project using the resulting future savings.

The partnerships that comprise a SIB involve six groups:

1. A Government
2. An Intermediary
3. Investors
4. Service Providers
5. Constituents
6. An Independent Evaluator

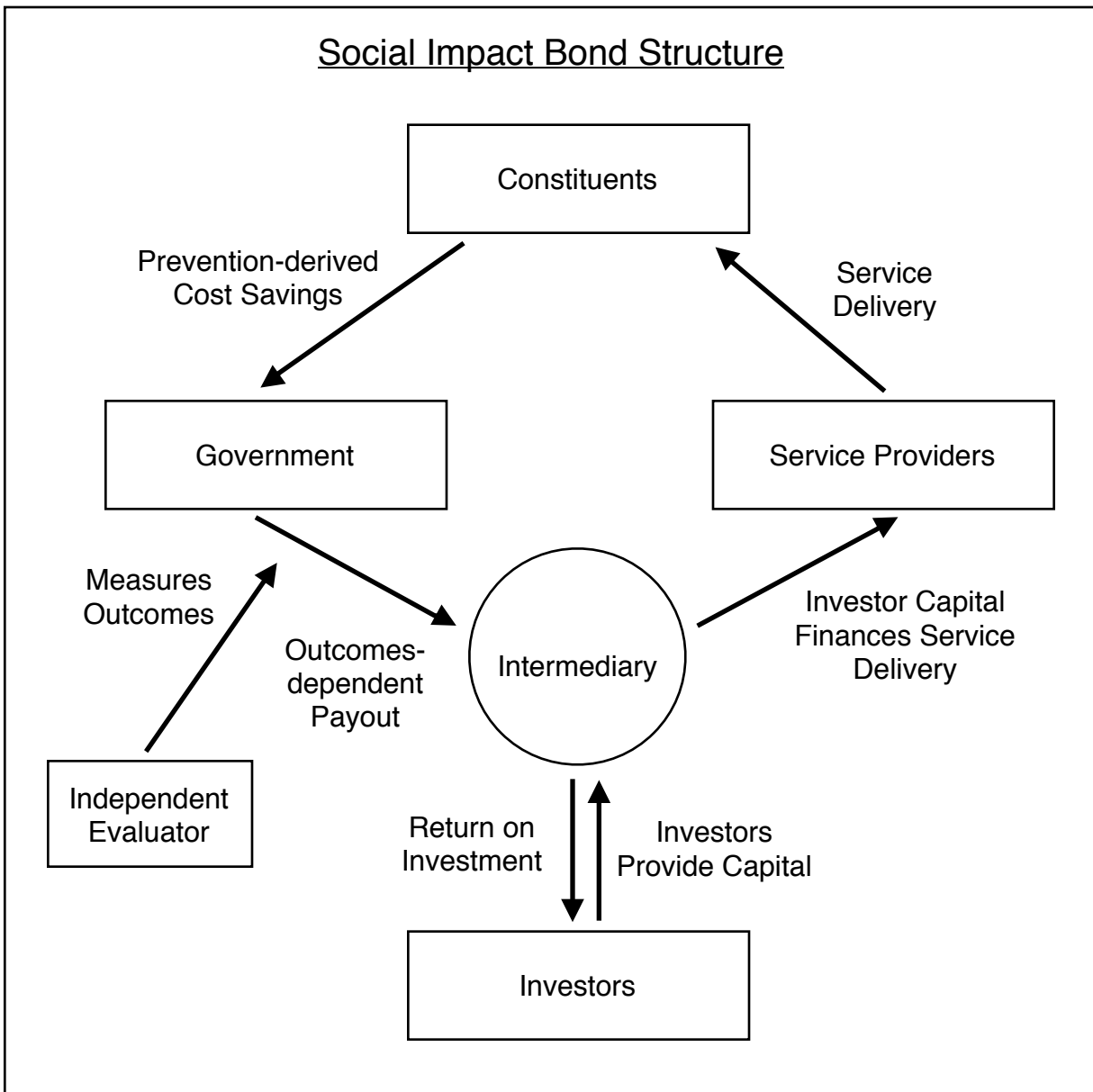
Figure 1 graphically summarizes the interactions between the six groups in a SIB.

³ Massachusetts Executive Office of Administration and Finance, (2012). *Massachusetts first state in the nation to announce initial successful bidders for 'pay for success' contracts*. Retrieved from website: <http://www.mass.gov/anf/press-releases/fy2013/massachusetts-first-state-in-the-nation-to-announce-ini.html>

⁴ Fact sheet: the Utah High Quality Preschool Program America's first social impact bond targeting early childhood education. (n.d.). Retrieved from <http://www.goldmansachs.com/what-we-do/investing-and-lending/urban-investments/case-studies/impact-bond-slc-multimedia/fact-sheet-pdf>

⁵ Badawy, M. (2012, October 19). *California city seeks to cut asthma rate via bond issue*. Retrieved from <http://www.reuters.com/article/2012/10/19/us-investing-impactbonds-health-idUSBRE89I0U120121019>

Figure 1:



The government initiates the formation of a SIB by contracting with an intermediary. The intermediary is tasked with raising capital from investors, and then using the capital to select, finance, and manage one or more service providers. Moreover, the intermediary is the central point of contact between the government, investors, and service providers. The selected service providers use the capital to deliver an evidence-based intervention that creates a positive social impact for constituents; appropriate interventions should generate government savings by using prevention as a means of reducing the size of publicly financed remedial programs. A best practice is to require that participating service providers be invested in the SIB in order to align incentives.

Prior to raising investor capital, the intermediary works with the government to define outcomes-based performance benchmarks as objectives for the evidence-based intervention. Over the lifetime of the SIB, an independent evaluator periodically measures the performance of the intervention based on predetermined metrics. The gold standard for measuring the impact of an intervention is a randomized controlled trial (RCT). RCTs are especially well-suited for SIBs because they measure the ‘attributable impact’ created by an intervention as well as the ‘total impact’ – which could be the cumulative result of the intervention and numerous other factors. When a RCT cannot feasibly be performed, other measurements may be acceptable instead. SIBs can be structured so that investors receive partial payouts when objectives are only partially achieved; the success of the intervention at meeting performance benchmarks as assessed by the independent evaluator would determine the amount of money that the government gives to the intermediary to pay out to investors. SIBs with higher rates of return for investors will be able to raise capital more easily; however, the payout to investors should not exceed the government savings created by the SIB. A successful SIB should achieve performance benchmarks and desired outcomes, create government savings, return investor principal, and pay out to investors a return on capital for taking on risk.

The emphasis on outcomes is essential. By measuring impact on the basis of outcomes rather than on units processed, SIBs remove the incentive for service providers to ‘cherry pick’ the easiest available cases⁶. For example, investors in a SIB designed to reduce youth recidivism through behavioral counseling should not be compensated based on the recidivism rate among the children who were counseled; this would incentivize service providers to only treat the children least likely to recidivate in the first place. A more appropriate evaluation metric would be the community-wide rate of youth recidivism; this metric incentivizes service providers to target the children most likely to recidivate for counseling, and has the government pay only for successfully achieved community-wide outcomes.

Importantly, the direct cost-savings that SIBs achieve are not necessarily produced immediately. A SIB designed to reduce youth recidivism in the juvenile justice system, for example, will take less time to begin producing cost savings than will a SIB designed to reduce the incidence of a cancer with a decades-long latency period. Governments must consider this when developing a SIB, because they need to include in their budgets capital to pay out to investors. Governments with poor credit ratings may find when their intermediary raises capital for a SIB, that investors demand a higher rate of return to compensate for counterparty risk. If a government is interested in developing a SIB, but has insufficient capital to pay out investors, then it might consider issuing a bond. If the present value of the future savings from a SIB is greater than the cost of

⁶ Disley, E., Rubin, J., Scraggs, E., Burrowes, N., & Culley, D. U.K. Ministry of Justice, (2011). *Lessons learned from the planning and early implementation of the social impact bond at HMP Peterborough*. Retrieved from website: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/217375/social-impact-bond-hmp-peterborough.pdf

paying investors, then a bond can provide governments with capital for investor payout for SIBs that do not immediately produce government savings.

IV. Health Impact Bonds

A SIB that focuses on improving public health is sometimes referred to as a 'health impact bond'. The service provider in a health impact bond should deliver a preventive evidence-based public health intervention that reduces morbidity and mortality, and thereby creates government savings through averted Medicare expenditures, Medicaid expenditures, lost productivity, and other public costs.

Health impact bonds are unique in the sense that the direct savings they create extend beyond averted government expenditures; by reducing morbidity, health impact bonds create direct savings for private health insurance providers as well. This introduces the potential for health impact bonds to be developed by health insurance companies, either in place of governments, or collaboratively in partnership with governments. In situations where a public health intervention could create direct savings for both a government and a private health insurance provider, the two parties could partner in forming a health impact bond in which they would divide the responsibility of returning capital to investors proportionately based on the relative share of the resulting savings they will experience. For example, consider hypothetically an evidence-based public health intervention designed to reduce hospitalizations and emergency department (ED) utilization in a community by improving access to preventive healthcare; if direct savings estimates were to suggest that 70% of the savings would benefit the state government through averted Medicaid expenditures, and 30% of the savings would benefit a regional health insurance company, then the state government and the health insurance company could partner in developing a health impact bond by agreeing to provide 70% and 30%, respectively, of the capital returned to investors. In certain cases, partnership in a health impact bond could appeal to both governments and insurance companies; governments would be able to share the burden of compensating investors; and the cost of capital to be paid out to investors would be lower for a public-private partnership than it would be for an insurance company acting independently.

V. Social Impact Bond Value Proposition

By aligning incentives, SIBs create opportunities for mutual benefit:

Governments

SIBs save governments money by replacing remedial programs with preventive intervention. By engaging private capital, SIBs can mobilize interventions that otherwise would be unaffordable for governments to finance themselves. Furthermore, by transferring risk to investors, SIBs enable governments to pay only for outcomes successfully achieved.

Investors

SIBs are the growing focus of interest among investors seeking a ‘double bottom-line’ of financial return and positive social impact. Moreover, SIBs represent a new asset class; it is unlikely that their performance will be correlated with other investments, and so SIBs may be an appealing solution for certain investors seeking diversification.

SIBs may become especially attractive investments for banks. In the United States, certain SIBs may qualify for CRA credit under the Community Reinvestment Act⁷. This creates opportunities for banks to comply with the mandates of the Community Reinvestment Act, and yield a financial return on investment. Investment banks are already responding. Goldman Sachs’ Urban Investment Group has invested in SIBs in the United States, and intends to pursue CRA credit⁸; their Urban Investment Group’s GS Social Impact Fund has a target size of \$250 million⁹. In November of 2013, Morgan Stanley announced the launch of the firm’s Institute for Sustainable Investing¹⁰; Morgan Stanley has set a five-year goal of investing \$10 billion in impact investments¹¹.

Constituents

Constituents benefit directly from SIB interventions. The type and magnitude of benefits derived are specific to the intervention and target population, and usually involve both direct and indirect benefits. SIBs can be drivers of job creation and economic growth in communities; they employ service providers, intermediaries, and independent evaluators, they can be designed to stimulate urban renewal, and certain SIBs can direct investment into sustainable industries and job training programs. Most importantly, SIBs allow innovative evidence-based interventions to be implemented that could be too novel for governments to finance themselves with taxpayer funds¹².

⁷ Goldberg, S. H. (2013, January). *Do sibs qualify for the Community Reinvestment Act? oh, yeah*. SIB TRIB, (2), 14. Retrieved from http://payforsuccess.org/sites/default/files/sib_trib_no._2.pdf

⁸ *ibid.*

⁹ *GS social impact fund*. (n.d.). Retrieved from <http://www.goldmansachs.com/our-thinking/focus-on/impact-investing/touts/fact-sheet.pdf>

¹⁰ *Morgan Stanley establishes institute for sustainable investing*. (2013, November 1). Retrieved from <http://www.morganstanley.com/about/press/articles/a2ea84d4-931a-4ae3-8dbd-c42f3a50cce0.html>

¹¹ *Institute for Sustainable Investing*. (n.d.). Retrieved from <http://www.morganstanley.com/sustainableinvesting/>

¹² Eddy, M. (2012, September). Scaling tuberculosis treatment through a social impact bond. *Instiglio*, 5. Retrieved from <http://www.instiglio.org/pub/Instiglio%20White%20Paper%20-%20Tuberculosis%20Social%20Impact%20Bond.pdf>

VI. Public Health in Schenectady, New York

Schenectady is a small city of 66,000 residents in upstate New York, where it is part of New York's Capital District¹³. In Schenectady County, the urban city of Schenectady is surrounded by suburban and rural towns. In 2013, local organizations were brought together to form the Schenectady Coalition for a Healthy Community; the coalition was tasked with conducting a community health assessment, and developing a health-focused community action plan. The Coalition proceeded by commissioning the UMatter Schenectady Survey.

The UMatter survey was a city-wide, neighborhood-level health assessment administered door-to-door by teams of community health workers equipped with iPads. The iPads contained up to 283 questions covering a variety of personal and community health topics. A response-dependent skip logic programmed into the survey software determined the number of questions asked of each participant.

Between February and May of 2013, the UMatter survey collected 2,074 responses from city residents. Schenectady's two highest-needs neighborhoods were intentionally oversampled. The survey's methods and results are reported in greater detail in the Coalition's *2013 Health Needs Assessment and Community Action Plan*, available online¹⁴.

Epidemiologists analyzed the survey results and reported back to the coalition. Based on the epidemiologists' recommendations and analysis, presentations from local healthcare providers, a voting system, and well defined prioritization criteria, the coalition members ranked the city's prevailing public health issues that most urgently needed to be addressed. The coalition ranked the following public health issues as the five leading priorities:

1. Mental Health/Substance Abuse
2. Inappropriate Emergency Department Utilization
3. Teen Pregnancy
4. Diabetes and Obesity
5. Smoking and Asthma (and Neighborhood Safety)

I used the findings from the UMatter Schenectady Survey to assess the suitability for public health-focused SIBs to be implemented in Schenectady. The following four sections of this white paper outline promising use cases. Three of the use cases

¹³ U.S. Census Bureau. (2013, December 13). *State & county Quickfacts: Schenectady County, N.Y.* Retrieved January 25, 2007, from <http://quickfacts.census.gov/qfd/states/36/3665508.html>

¹⁴ Pratt, D., & Buckenmeyer, E. (2013, November 15). 2013 community health needs assessment and community action plan: a consolidated, multi-agency, community-wide plan for action to improve the health of people in Schenectady, New York. *Schenectady Coalition for a Healthy Community*, Retrieved from <http://www.schenectadychamber.org/files/814.pdf>

(asthma, type 2 diabetes, and tobacco smoking) address public health issues that the coalition included in their top five priorities. One of the use cases (falls among seniors) addresses a public health issue that the coalition identified as an urgent priority, but did not include as one of the top five.

VII. SIB Case: Asthma

Asthma is especially prevalent among children in urban environments. Below are key incidence metrics for Schenectady County:

- Asthma ED visits in Schenectady County from 2005-2007 = 3,080 ¹⁵
- Asthma hospitalizations in Schenectady County from 2005-2007 = 637 ¹⁶

From 2005 to 2007, there were an average of 1,026 and 212 asthma-related ED visits and hospitalizations, respectively, in Schenectady County. The US Census estimates that in 2012 the city of Schenectady and Schenectady County had populations of 66,078 ¹⁷, and 155,124 ¹⁸ respectively. Asthma is often disproportionately prevalent in urban environments; this suggests that the asthma incidence rate is higher in the city of Schenectady than in Schenectady county. However, if we assume that these incidence metrics and demographics are relatively stable, and that the asthma incidence rate in the city of Schenectady is similar to that of the county, then we can assume that asthma annually causes approximately 437 ED visits and 90 hospitalizations in the city.

In 2007, the average cost of an asthma ED visit was \$151, and the average cost of an asthma hospitalization was \$6941 ¹⁹. By applying these average costs to our ED visit and hospitalization estimates, we can estimate that asthma-related hospitalizations and ED visits in the city of Schenectady annually cost approximately \$690,677.

The National Cooperative Inner City Asthma Study found that a multi-faceted in-home tailored intervention was effective at controlling asthma symptoms and reducing

¹⁵ New York State Department of Health, Center for Community Health. (2009). *New York State asthma surveillance summary report*. Retrieved from website: http://www.health.ny.gov/statistics/ny_asthma/pdf/2009_asthma_surveillance_summary_report.pdf

¹⁶ *ibid.*

¹⁷ U.S. Census Bureau. (2013, December 13). *State & county Quickfacts: Schenectady (city), N.Y.* Retrieved January 25, 2007, from <http://quickfacts.census.gov/qfd/states/36/3665508.html>

¹⁸ U.S. Census Bureau, *State & county Quickfacts: Schenectady County, N.Y.*

¹⁹ New York State Department of Health, Center for Community Health, *Asthma surveillance summary report*.

morbidity²⁰. This preventive intervention involved home environmental assessments, education, and the use of mattress covers, pillow covers, HEPA vacuums, HEPA air filters, smoking cessation, pest management, minor repairs, and intensive household cleaning. The study found that, in children, the intervention led to a median decrease of 21 asthma symptom days per year, a median decrease of 12 missed school days per year, and a combined median decrease of 0.57 acute healthcare visits per year. In adults, the study found only borderline or no improvement in healthcare utilization.

In children, the intervention was successful at cost-effectively producing cost savings through minor or moderate environmental remediation with an educational component. The cost savings came in the form of averted asthma care expenditures and improved productivity. For participants who required minor or moderate environmental remediation, the cost of the program per participant was between \$231 and \$3,796; the program cost per participant was \$3,796 to \$14,858 when major environmental remediation was necessary. Ultimately, cost-benefit studies determined that the intervention generates \$5.30 to \$14.00 in return for every dollar invested.

The cost-benefit analysis suggests that a SIB would be a sustainable vehicle for scaling up asthma prevention in the city of Schenectady. Additional study is still needed beyond these preliminary estimates in order to better understand asthma-related costs, as well as to better assess the suitability of the multi-faceted intervention for Schenectady. City-wide asthma-related hospitalization/ED visits could be good outcome metrics for an asthma-focused SIB.

VIII. SIB Case: Falls Among Seniors

Schenectady County experiences a high incidence of falls among seniors, as well as a fall-related mortality rate that exceeds the New York State average. Below are three important measures of incidence:

- Mean Annual Frequency of Emergency Department Visits due to Falls in Residents Ages 65+, 2006-2008 in Schenectady County = 1,101 ²¹
- Mean Annual Frequency of Hospitalizations due to Falls in Residents Ages 65+, 2006-2008 in Schenectady County = 543 ²²

²⁰ Jacobs, D. E., & Baeder, A. (2009). Housing interventions and health: a review of the evidence. *National Center for Healthy Housing*, Retrieved from <http://www.nchh.org/LinkClick.aspx?fileticket=2lvaEDNBldU=&tabid=229>

²¹ New York State Department of Health, Injury Prevention Program. (2010). *Incidence of unintentional fall injuries, ages 65+ emergency department (ed) visits new york state residents, 2006-2008*. Retrieved from website: http://www.health.ny.gov/statistics/prevention/injury_prevention/docs/2006_2008_falls_ed65_county.pdf

²² New York State Department of Health, Injury Prevention Program. (2010). *Incidence of unintentional fall injuries, ages 65 hospitalizations new york state residents, 2006-2008*. Retrieved from website: http://www.health.ny.gov/statistics/prevention/injury_prevention/docs/2006_2008_falls_hospital65_county.pdf

• Mean Annual Frequency of Mortality due to Falls in Residents Ages 65+,
2006-2008 in Schenectady County = 9²³

The US Census estimates that in 2012, Schenectady County's ages 65 and older population was 23,423²⁴. The Census also estimates that in 2012, the city of Schenectady had a population of 66,078, and that in 2010 11.4% of the city's population (7,532) was age 65 or older²⁵. Altogether, if we assume that these rates and demographics have remained relatively stable and that incidence rates in the city are similar to those in the county, then we can assume that 32% of seniors in Schenectady County reside within the city of Schenectady, and we can estimate that the city annually experiences approximately 354 ED visits, 174 hospitalizations, and nearly 3 deaths due to falls among seniors.

The United States Centers for Disease Control and Prevention (CDC) reports that the average Medicare costs per fall are between \$9,113 and \$13,507²⁶. The average costs of a fall-related ED visit is probably different than the average cost of a fall-related hospitalization. However, if we apply the CDC's average Medicare costs to our ED and hospitalization estimates, then we can estimate that fall-related ED visits and hospitalizations in seniors ages 65 and older in the city of Schenectady cost between \$4,811,664 and \$7,131,696 annually.

The Falls-HIT (Home Intervention Team) Program is a fall prevention intervention that involves home visits by occupational therapists and supports home modification to improve safety²⁷. A study found that the Falls-HIT Program reduced the fall rate among participants by 31%²⁸. Based on the previous cost estimates, if the Falls-HIT Program were implemented with similar efficacy throughout Schenectady, then it could produce between \$1,491,615 and \$2,210,825 in annual savings through fall prevention.

²³ New York State Department of Health, Injury Prevention Program. (2010). *Incidence of unintentional fall injuries, ages 65 deaths new york state residents, 2006-2008*. Retrieved from website: http://www.health.ny.gov/statistics/prevention/injury_prevention/docs/2006_2008_falls_deaths65_counties.pdf

²⁴ U.S. Census Bureau, *State & county Quickfacts: Schenectady (county), N.Y.*

²⁵ U.S. Census Bureau, *State & county Quickfacts: Schenectady (city), N.Y.*

²⁶ U.S. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. (2013). *Cost of falls among older adults*. Retrieved from website: <http://www.cdc.gov/homeandrecreationalafety/falls/fallcost.html>

²⁷ Stevens, J. A. U.S. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. (2010). *A CDC compendium of effective fall interventions: what works for community-dwelling older adults, 2nd edition*. Retrieved from website: http://www.cdc.gov/homeandrecreationalafety/pdf/cdc_falls_compendium_lowres.pdf

²⁸ *ibid.*

These preliminary estimates suggest that fall prevention could be a viable use case for SIBs. Moving forward, more investigation would be necessary to better understand fall prevalence within the city, associated costs, as well as the scalability and efficacy of a fall prevention program in Schenectady. Fall prevention produces direct savings through averted healthcare costs, and so a fall prevention SIB could be well suited for facilitating a partnership between public and private health insurance providers. Appropriate outcome metrics for this type of SIB would be hospitalization, ED visits, and mortality due to falls per 10,000 population age 65 and older in the city of Schenectady.

IX. SIB Case: Type 2 Diabetes

Type 2 diabetes is epidemic in New York State²⁹. Results from the U Matter Schenectady Survey indicate that the prevalence in the city is high:

- 11.6% of all U Matter respondents reported that they had been diagnosed with type 2 diabetes by a health professional³⁰.
- Among non-diabetic U Matter respondents, 13.9% reported that they had been diagnosed with pre-diabetes by a health professional³¹.

Type 2 diabetes is an expensive chronic disease to manage. The average annual cost of healthcare for a person with diabetes is \$11,744, of which \$6,649 is attributable to diabetes³². In contrast, the average annual cost of healthcare for a non-diabetic is \$2,560³³. All respondents in the U Matter survey were ages 18 and older; the US Census estimates that in 2012, the city's 18 and older population was 49,954³⁴. From the U Matter findings, we can estimate that in the city's 18 and older population, there are approximately 5,794 people with type 2 diabetes, and 6,138 people with pre-diabetes. By this, we can further estimate that among adults in the city of Schenectady, annual medical expenditures attributable to type 2 diabetes amount to approximately \$38,524,306.

²⁹ New York State Department of Health, Division of Chronic Disease and Injury Prevention. (2011). *Dual epidemics of diabetes and obesity are on the rise among New York State adults*. Retrieved from website: http://www.health.ny.gov/statistics/prevention/injury_prevention/information_for_action/docs/2011-4_ifa_report.pdf

³⁰ Pratt, D., & Buckenmeyer, E., "2013 community health needs assessment and community action plan".

³¹ *ibid.*

³² Dall, T., Edge Mann, S., Zhang, Y., Martin, J., Chen, Y., & Hogan, P. (2008). Economic cost of diabetes in the U.S. in 2007. *Diabetes Care*, 31(3), doi: 10.2337/dc08-9017

³³ New York State Department of Health, (2012). *Diabetes*. Retrieved from website: <http://www.health.ny.gov/diseases/conditions/diabetes/>

³⁴ U.S. Census Bureau, *State & county Quickfacts: Schenectady (city), N.Y.*

The National Diabetes Prevention Program is an evidence based intervention that reduces the risk of developing type 2 diabetes by 58% in people with pre-diabetes³⁵. The program is available in Schenectady³⁶, but the capacity is restricted by maximum class sizes and the availability of personnel and facilities. A SIB could be effective at scaling the program. If the National Diabetes Prevention Program were expanded in Schenectady, it could prevent up to 3,560 people with pre-diabetes from developing type 2 diabetes, and would thereby generate up to \$26,775,124 in annual savings through averted healthcare expenditures attributable to diabetes.

The cost of diabetes and efficacy of preventive intervention together suggest that a diabetes-focused SIB could be effective in Schenectady. More investigation should be conducted to measure pre-diabetes prevalence, and to more precisely estimate the scalability and efficacy of the National Diabetes Prevention program in Schenectady. An appropriate outcome metric for this SIB could be type 2 diabetes incidence in the city of Schenectady.

X. SIB Case: Tobacco Smoking

According to the CDC, tobacco use is the leading cause of preventable death in the United States, and life expectancy is 10 years shorter for people who smoke³⁷. The UMass survey found that 37.1% of respondents are current smokers; all respondents in the survey were ages 18 and older³⁸. In 2012, the city of Schenectady had 18 and older population of 49,954³⁹. Altogether, we can estimate that there are approximately 18,532 adult smokers in Schenectady.

Based on data from a 2008 CDC Morbidity and Mortality Weekly Report, the American Lung Association estimated that smoking cost an average of \$4,260 per adult smoker in lost productivity and direct healthcare expenditures in 2004⁴⁰. If we assume that the cost of smoking has remained relatively constant since 2004, then the American Lung Association's estimation suggests that the cost of adult smoking in Schenectady is approximately \$78,946,320 annually.

³⁵ U.S. Centers for Disease Control and Prevention, (2013). *National Diabetes Prevention Program*. Retrieved from website: <http://www.cdc.gov/diabetes/prevention/about.htm>

³⁶ *YMCA diabetes prevention program*. (n.d.). Retrieved from <http://www.cdymca.org/healthyliving/diabetes.aspx>

³⁷ U.S. Centers for Disease Control and Prevention, (2013). *Tobacco-related mortality*. Retrieved from website: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/tobacco_related_mortality/index.htm

³⁸ Pratt, D., & Buckenmeyer, E., "2013 community health needs assessment and community action plan".

³⁹ U.S. Census Bureau, *State & county Quickfacts: Schenectady (city), N.Y.*

⁴⁰ American Lung Association, (n.d.). *Smoking*. Retrieved from website: <http://www.lung.org/stop-smoking/about-smoking/health-effects/smoking.html>

The U Matter Schenectady Survey found that although smoking prevalence in Schenectady is high, there is also great interest in cessation. The survey found that 49.2% of current smokers have tried to quit within the last year; out of these respondents, 65.2% reported that they attempted to quit without assistance by going 'cold turkey'⁴¹. For many smokers, assisted quit programs can be more effective. In a 2000 study, Zhu *et al.* found that smokers who tried to quit with assistance (15.2%) were more successful than those who tried to quit unassisted (7.0%)⁴².

The Butt Stops Here is a one-on-one counseling program that, cooperatively, is hosted in Schenectady at Ellis Hospital and run by Seton Health of the Albany-based St. Peter's Health Partners. The program achieves a 30% quit rate⁴³. With greater access to capital and a scaled up referral system, The Butt Stops Here could increase its service capacity. A SIB could be an effective solution. Up to \$11,653,289 could be saved annually by extending The Butt Stops Here to adult smokers in Schenectady who have tried to quit in the last year; up to \$23,685,548 in annual savings could be achieved by extending the program to all of Schenectady's adult smokers.

A SIB for smoking cessation and prevention in Schenectady could produce significant cost savings by scaling new or existing programs. Smoking prevalence, as measured by the U Matter Schenectady Survey or other public health surveillance systems, would be an appropriate outcome metric for evaluating the success of the intervention.

XI. Discussion and Recommendations

The evidence-based interventions outlined in the preceding sections can improve Schenectady's public health and generate savings:

<u>SIB Use Case</u>	<u>Estimated Total Savings</u>
• Asthma prevention	\$5.30 to \$14.00 per dollar invested
<u>SIB Use Case</u>	<u>Estimated Annual Savings</u>
• Fall prevention among seniors	Between \$1,491,615 and \$2,210,825
• Type 2 diabetes prevention	Approximately \$26,775,124
• Tobacco Smoking cessation	Approximately \$23,685,548

I recommend that Schenectady explore these, and other opportunities for developing public health-focused SIBs. I also recommend that the city work collaboratively to

⁴¹ Pratt, D., & Buckenmeyer, E., "2013 community health needs assessment and community action plan".

⁴² Zhu, S., Melcer, T., Sun, J., Rosbrook, B., & Pierce, J. (2000). Smoking cessation with and without assistance: a population-based analysis. *American Journal of Preventive Medicine*, 18(4), 305-11. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10788733>

⁴³ 'The Butt Stops Here' smoking cessation Troy support group. (2010, June 28). Retrieved from http://www.setonhealth.org/news_events/event_detail.cfm?ID=286

develop SIBs in partnership with New York State and with private health insurance companies.

Importantly, the SIB use cases in this report only present preliminary estimates of maximum possible cost savings. The estimates do not account for costs of developing and deploying SIBs, such as contracting with intermediaries and compensating investors. Further analysis should be conducted for each use case in order to better estimate prevalence, incidence, and costs attributable to morbidity and mortality. In addition, the interventions to be considered should be evidence-based, ethical, and they should be chosen on the basis of feasibility, scalability, and probable efficacy in Schenectady.

Schenectady is well suited for developing and deploying a health impact bond. It is the only city in upstate New York's geographically second smallest county; it is served by a county health department, a single acute care hospital with a formal outpatient campus, and a Medicaid Health Home; and Schenectady is located in a region with significant academic resources. Schenectady can draw on services and expertise from an organized community-wide coalition of health and community service providers; and, the majority of non-government health insurance in Schenectady is provided by two regional not-for-profit health plans.

SIBs are a relatively new invention, and the regulatory framework that governs them is still developing at the state and federal levels. The two SIB pilots now underway in New York City and New York State demonstrate that SIBs can legally be developed in New York's largest city, and within a designated state program. Schenectady is generally subject to the more restrictive provisions of the state's Local Finance Law, and therefore should consult with legal experts and perhaps consider requesting special state legislation.

As the adoption of health impact bonds continues, I hope that accountable care organizations, patient-centered medical homes, and employers will join governments and health insurance providers as partners in health impact bond development. In the future, health impact bonds could become major drivers of investment into public health. Furthermore, they could create economic incentives for deploying resources for addressing neglected public health challenges that before were unprofitable.

I expect that SIBs will grow tremendously as an asset class. I predict that in the future, SIBs will be able to raise investor capital through formal initial public offerings, and I expect that SIB shares will be traded on dedicated exchanges as dividend-yielding securities. This could perhaps give rise to the creation of 'exchange-traded SIB funds' (ETSFs) that would enable investors to make diversified or sector-specific impact investments across multiple SIBs. In the future, it would be interesting to see the first ever 'immunization ETF', 'clean water ETF', 'cancer prevention ETF', 'pollution reduction ETF', or 'New York State ETF'.