

First social impact bond for the SAMRC: A novel financing strategy to address the health and social challenges facing adolescent girls and young women in South Africa

F Abdullah,¹ MB ChB, FCPHM; T Naledi,^{2,3} MB ChB, FCPHM; E Nettleship,⁴ MSc, MChem; E L Davids,^{5,6} BPsych, MA, PhD; L Vanleeuw,^{1,7} BSocSci, MPhil; S Shangase,¹ M Ramburuth,¹ BSc, MPDM; N Majola,¹ BA, PDM; L Dudley,⁸ MB ChB, MMed, PhD; M Nyirenda,⁸ PhD, MPhil, BA; C Mathews,⁷ MSc, PhD; T Kreddo,⁵ MB ChB, MMed; A Kinghorn,⁹ MB BCh, MA; G Gray,¹⁰ MB ChB, FCPaed; S de Witt,¹¹ BVSc, MBA

¹ Office of AIDS and TB Research, South African Medical Research Council, Cape Town, South Africa

² Desmond Tutu HIV Research Centre, University of Cape Town, South Africa

³ Division of Public Health Medicine and Family Medicine, University of Cape Town, South Africa

⁴ Social Finance, London, United Kingdom

⁵ Cochrane Centre, South African Medical Research Council, Cape Town, South Africa

⁶ Adolescent Health Research Unit, University of Cape Town, South Africa

⁷ Health Systems Research Unit, South African Medical Research Council, Cape Town, South Africa

⁸ Burden of Disease Research Unit, South African Medical Research Council, Cape Town, South Africa

⁹ Perinatal HIV Research Unit, University of the Witwatersrand, Johannesburg, South Africa

¹⁰ Office of the President, South African Medical Research Council, Cape Town, South Africa

¹¹ Bertha Centre for Innovation and Social Entrepreneurship, Graduate School of Business, University of Cape Town, South Africa

Corresponding author: F Abdullah (fareed.abdullah@mrc.ac.za)

A social impact bond (SIB) is an innovative financing mechanism to attract investors to social programmes traditionally funded by governments. In this article, in celebration of the 50th anniversary of the South African Medical Research Council (SAMRC), the authors describe the SAMRC's first foray into this new world of financing through a SIB to improve the health and quality of life of adolescent girls and young women (AGYW). The AGYW SIB is in its preparatory phase and is scheduled for implementation in 2020. The authors describe the mechanism, including financial flows and the process of customising the SIB to meet the needs of AGYW, focusing on HIV prevention and treatment and the prevention and management of unintended pregnancies in schoolgoing AGYW. The authors outline an approach to designing the package of interventions, the metrics associated with such a programme and the business model. It is hypothesised that the proposed approach will lead to an improvement in programmatic outcomes, monitoring and evaluation tools and cost-effectiveness, and will develop key learning data for the future use of SIBs in health service delivery.

S Afr Med J 2019;109(11 Suppl 1):57-62. <https://doi.org/10.7196/SAMJ.2019.v109i11b.14254>

Social impact bonds (SIBs) are a novel way of investing in social programmes, and the South African Medical Research Council (SAMRC) will be venturing into new and innovative territory when it launches its first SIB in 2020. As shown in Fig. 1, in a SIB, a social investor (SI)^[1] which may be a commercial or philanthropic investor, who seeks to achieve both a social and a financial return on their investment, funds an implementer to deliver a social programme. The SI is reimbursed by an 'outcomes funder' if the implementer achieves specified outcomes. The SI carries the risk of failure, and governments (or other outcomes funders) only pay if beneficiaries experience positive socio-economic outcomes that are independently verified and where there is a future saving. If the programme is successful, the SI not only recoups its capital investment but also generates a reasonable return on investment which can be seen as a share of the saving. This scheme opens new markets for investors and responds to growing investor demand for investing in socially relevant causes. There are many types of social or impact investment instruments, with SIs placed on a spectrum between commercial and philanthropic investment, depending on their priorities.

For governments, SIBs can raise investment for public programmes that have proven to be effective but still carry risks around implementation which the government wishes to transfer, e.g. application of the intervention to a different context or population. For the social sector, new opportunities arise for investment in social programmes that focus on prevention and thus tend to be underfunded in favour of curative care, or in situations where innovation and service delivery are needed, and the delivery risks are considered too high for delivery through conventional public services. In general, SIBs do not fund research, and so – given the complex area of adolescent girls and young women (AGYW) – the SAMRC is well placed to contribute to the building of research to generate learning around what is and is not working where and why, in order to strengthen design of a SIB in this area, thereby informing the ongoing design and effectiveness of AGYW programmes and ensuring efficient allocation of resources. The general logic of a SIB is shown in Fig. 1.

The first SIB was established in 2010 in the UK, where social investors funded a programme to reduce recidivism in short-sentenced offenders leaving Peterborough Prison.^[2] A service provider,^[3] an

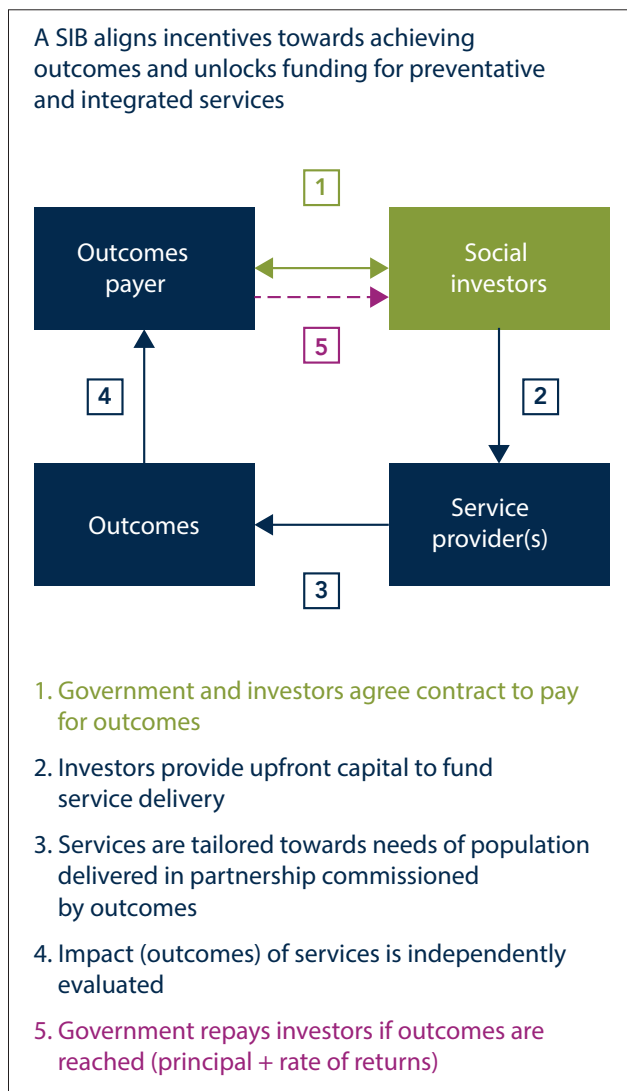


Fig. 1. Simplified graphic representation of the generic SIB logic. (SIB = social impact bond.) Adapted from Social Finance/Bertha Centre.

umbrella organisation called ‘The One Service’ responsible for implementing the SIB, worked with recently released inmates from Peterborough Prison through a community-based programme of social rehabilitation, skills development and psychosocial support. The UK government only reimbursed the investor for successful outcomes achieved, i.e. a reduction of reoffending rates compared with a national control group. The outcome was a win-win for all parties: the government saved money by keeping recently released inmates out of prison, the inmates benefitted by being reintegrated into society and the investor generated a modest return on investment.^[4] Since Peterborough, there have been more than 150 SIBs,^[5] mainly in the UK but also in the USA and in other European countries such as The Netherlands. Recently, SIBs were launched in countries ranging from India to Palestine and South Africa (SA), and new SIBs are being designed in countries such as Kenya and Cambodia.

The emerging international experience has seen SIBs fill critical gaps in the delivery of social and healthcare services, particularly with initiatives that focus on prevention which, by their nature, do not tackle imminent crises and tend to be de-prioritised when governments experience fiscal or capacity constraints. SIBs are not intended to replace or compete with, but rather to complement and strengthen, existing services by focusing on areas otherwise neglected

in public programmes. Policymakers are increasingly attracted to buying demonstrable outcomes from a SIB intervention, compared with paying for input costs in initiatives with uncertain outcomes. Further, in designing programmes that apply existing evidence to local contexts, and emphasising measurable outcomes, SIBs have the potential for developing methodologies that could be adopted and scaled-up in the public sector.

The SAMRC SIB aims to tackle the difficult problem of health and quality of life for AGYW in SA. AGYW face high rates of HIV infection, unintended pregnancies,^[6] poor pregnancy outcomes, school dropout, gender-based violence, low access to post-school education and a future of unemployment and lack of access to economic opportunities.^[7-9] In SA, HIV incidence among AGYW aged 15 - 24 is among the highest compared with any other age group globally.^[10] Fig. 2 illustrates that although HIV incidence has declined since it peaked in 1997, the rate in SA remains unacceptably high. Unintended pregnancies in schoolgoing AGYW has reached epidemic proportions, accounting for more than 1 in 10 pregnancies annually. Chersich *et al.*^[6] recently reported that two-thirds of pregnancies in SA were unintended, and the rate of unintended pregnancy was even higher in young women. Further, 90% of pregnancies were unintended among 15 - 19-year-olds and 79% were unintended among 20 - 24-year-olds.

Long-term effects of unintended pregnancy and HIV infection include health, social, educational and economic challenges. A study in the Eastern Cape Province of SA demonstrated an association between early adolescent pregnancy and HIV acquisition. Additionally, these findings were strongly correlated with sexual behaviours, including multiple sexual partnerships and age-disparate relationships.^[11] Both these outcomes are driven by social and structural conditions such as limited economic opportunities, gender inequality and powerlessness. A study on pregnant adolescent girls revealed that high maternal and infant mortality rates were associated with an increased incidence of sexually transmitted infections.^[12]

SA programmes such as loveLIFE^[14,15] and Soul City^[16-18] have been leading attempts to address vulnerabilities of AGYW for more than two decades. The success of these programmes has been equivocal, with a major limitation being the difficulty of measuring^[15] the specific impact that these programmes have had on this important population sub-group.^[15,19] Whilst these programmes may have contributed to knowledge and some behaviour change and possibly reductions in morbidity and mortality in AGYW, we are little the wiser in our ability to measure the specific and relative impact of each intervention with a view to intensifying and scaling-up successful interventions and divesting of ineffective programme interventions. More recently, President’s Emergency Plan for AIDS Relief and the Global Fund have made major investments in AGYW programming,^[20,21] as has the South African Department of Health.^[22] However, these programmes are currently under way and their impact will only be measured once evaluations have been completed.^[23]

Therefore, it is imperative to act now, not only to gather the evidence we need to more effectively design AGYW programmes upfront, but also to change the way we implement and learn from AGYW programmes on an ongoing basis. A SIB approach enables us to rigorously incorporate and test implementation adjustments and improvements over time in a way which transfers implementation risk away from government and other outcomes funders. The SIB requires precision in the delivery of interventions at a pre-determined payment value but leaves the operational model flexible to adapt over time as payments are made for outcomes, not activities. In addition, as the SI takes on the risk of failure, it is incentivised to capacity-build

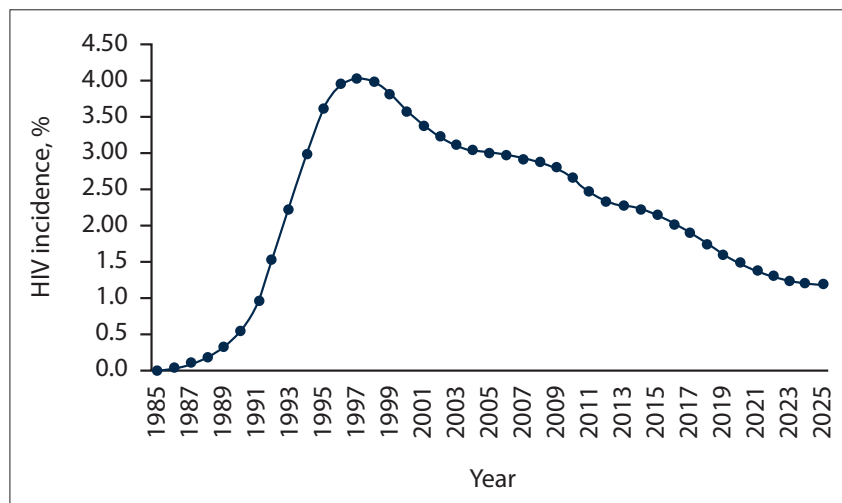


Fig. 2. Graph of HIV incidence in AGYW. (AGYW = adolescent girls and young women.)
Source: Thembisa 4.1^[33]

the service provider, bringing new skills, partnerships and experience to support programme delivery. It will also conduct its own due diligence of the service provider, e.g. requiring the latter to possess the ability to make operational changes to the programme on an ongoing basis if outcomes are not achieved. The SIB therefore incentivises a focus on outcomes over inputs and creates an adaptive programming environment that identifies and tackles operational obstacles as they emerge to increase the chances of delivering successful outcomes.

To lay the basis for SIB design work, the SAMRC has been conducting a systematic review of the evidence around AGYW programming, identifying what has been learned from previous programmes and potential improvements that will be tested using the SIB. These improvements will feed into the design of the SIB, supporting assessment of cost-effectiveness and cost-benefit, the tracking of the delivery of interventions to each AGYW and the determination of metrics that will measure outcomes with greater precision. Our hope is that this approach will help to put research into practice in a rigorous way, providing the data and learning needed to drive a step-change in the realisation of health and quality-of-life outcomes for AGYW in SA.

A comprehensive approach^[24]

Previous programmes for AGYW focused on a single outcome such as HIV prevention or a decrease in unintended pregnancies, and were directed mainly at the individual without due regard to external ecosystem factors that create barriers to successful outcomes. There is now greater recognition of the need to address the underlying socio-

cultural and -economic drivers including the contextual intricacies that increase individual risk and vulnerability to HIV and unintended pregnancy.^[25]

All the evidence now points in the direction of a comprehensive approach^[26] that brings together interventions to address multiple outcomes for AGYW, including HIV prevention, successful treatment for HIV-positive AGYW, a decline in unintended pregnancies, safe pregnancy and early return to school, school completion, reducing vulnerabilities to gender-based violence, and economic opportunities. This comprises the guidance from the United Nations (UN) that promotes this approach in its goals to achieve the Sustainable Development Goals (SDGs), signifying a shift away from single-disease outcomes such as HIV prevention as described in its Millennium Development Goals Strategy (MDGS). Current expert opinion is pointing in a similar direction.^[26] Though the AGYW SIB will follow this general guidance, the approach increases the complexity of disaggregating the specific effect of different intervention components. This challenge is addressed by employing a cluster-randomised control design that is able to measure the effect for each outcome separately.

Preliminary work by the SAMRC has shown that HIV seroconversion correlates with unintended pregnancies^[27] and school completion^[28] and that HIV infection is associated with poor outcomes for unintended pregnancies^[29,30] and poor educational outcomes. A Statistics South Africa report demonstrated that school attendance declined from 85% in adolescents without children to 51% in adolescents who have had a child.^[31] Unintended pregnancies among young women have been associated with poor maternal and reproductive health

outcomes^[32] as well as poor child health outcomes, and this indicates the potential impact of scaling up contraception on maternal and child mortality and child survival.^[31] School dropout, unintended pregnancies, intimate partner violence, poor general health and nutritional status have been associated with poor HIV outcomes such as early seroconversion, low uptake for testing and treatment, loss to retention in care, virological failure and increased morbidity and mortality. It is well established that adolescents living with HIV have poorer adherence to ART^[33] and are the only age group with increasing HIV mortality. Relative to adults at each stage of the care cascade, they fare worse, and it is critical to implement interventions to retain them in care and promote adherence to ART.^[34] Sexual assault and intimate partner violence (IPV) are also associated with poor HIV outcomes.^[35] Economic status and HIV outcomes are inextricably linked.^[36] Crankshaw *et al.*^[37] make a compelling case for contraception to be placed at the centre of the HIV prevention agenda and thus at the centre of the package of interventions offered to young women.

Hence, the package of interventions will need to address multiple outcomes through well-prioritised interventions and will need to collaborate and co-ordinate its implementation with complementary and supportive initiatives with shared objectives. Although this makes it more complicated, this comprehensive approach is required to tackle the complex area around AGYW health. The incentives to collect, analyse and respond to data which the SIB approach provides will help to improve our understanding and knowledge of what is working where and why. Additionally, given the complex nature of implementing programmes aimed at transforming structural and social norms, it is prudent to ensure that the interventions are inclusive and community-centred for increased effectiveness and sustainability. Based on this evidence, the SAMRC has designed a package of interventions which aims to address multiple outcomes by targeting several role players (e.g. AGYW, teachers, parents, healthcare providers, community) in a whole-system approach that includes the school community and health services. This approach is supported in the literature.^[38]

Combination approaches

Both biomedical and socio-behavioural interventions need to be combined for effective programming for AGYW. The key biomedical interventions in the SAMRC

package include (i) a test-and-treat package for HIV-positive AGYW together with linkage to care and measures to improve retention and adherence to achieve consistent viral suppression; (ii) pre-exposure prophylaxis (PrEP); (iii) contraception; and (iv) safe pregnancy.

Biomedical interventions by themselves will only achieve a limited impact and should take into consideration the psychosocial and behavioural aspects for AGYW within the context of the familial environment, the education system and larger social community which are equally, if not more, important in fostering positive outcomes. Further, mental health and substance abuse^[39-41] have been shown to play a pivotal role in the outcomes related to HIV, unintended pregnancy, durable viral suppression and early antenatal attendance, and these have been factored into the intervention.

The package of interventions developed by the SAMRC is informed by current evidence and best-practice guidelines, and draws on expert opinion, delivery experience and feedback from AGYW by means of a qualitative study involving just under 500 AGYW. Additionally, rigorous work will be undertaken to design the SIB and better understand quality of service delivery, effectiveness and associated costs through, for example, costing the package of interventions by conducting a cost-benefit analysis, an examination of affordability and determining acceptability through a qualitative study to understand the needs and perceptions of AGYW. Pulling together research and practice, the SAMRC SIB approach will, therefore, provide an optimised business model to improve the outcomes associated with these programmes through testing, adaptation and rigorous measurement of the results.

Metrics for the AGYW SIB and data-collection tools

Implicit in the SIB approach is the ability of a programme to document successful outcomes, as this forms the basis of reimbursement to the social investor. The SIB model requires individual outcomes to be measured as the basis of reimbursement – this involves agreeing on the targets, baselines and the definition of a successful outcome which is then independently verified. Such an approach creates a critical dilemma for AGYW programming, as no comprehensive system exists in SA for registering AGYW onto programmes and tracking the interventions they receive from a programme whilst documenting biomedical outcomes such as HIV seroconversion, viral suppression or effective contraception. Unique identifiers for users of multi-layered interventions across health, education and social services do not exist in SA and less so for community-based AGYW programming. The SIB intervention uses a unique identifier and a digital solution that documents, real-time, interventions provided and links to services provided in the health and education system and individual results from these services.

An alternative approach is to measure the effect for each of the outcomes across the cohort at the end of the intervention period. This will require controls, and the AGYW SIB will employ a cluster-randomised control study design to measure these effects. Baseline or background rates have been determined using a model based on national estimates published in the literature. Sample size calculations are based on detecting a statistically significant effect to show a decline of 15% and 20% in HIV seroconversion and unintended pregnancies and a 50% increase in viral suppression and early antenatal attendance at the beginning of the intervention period. These will be measured in the SIB intervention at the end of the intervention period, when the true measure will be known.

Independent evaluation is essential for determining the level – or lack – of success of the programme, and an objective determination of the level of return on investment or reimbursement. Independent

evaluation in a SIB is akin to the verification of financial statements in determining the financial position of a business and the distribution of dividends, though it does not replace the need for independent audit.

Real-time data are needed for programme management purposes. As the SIB philosophy is that only the outcomes matter, the implementer is delegated the authority and flexibility to make operational changes if outcomes are not being achieved. For this to happen, real-time data are needed to track progress in the programme to enable the implementer to identify problems early and to make adaptations during implementation as required.

Access to real-time data will also allow the SI to evaluate performance of the SIB on an ongoing basis. Often this role is supported by a performance manager (a specialist in data analysis and adaptive management) who works closely with the service provider to ensure that results are achieved effectively and efficiently, for example by tracking key performance indicators (KPIs), outputs and outcomes, suggesting improvements and preparing reports to investors. The proposed structure of the AGYW SIB is shown in Fig 3.

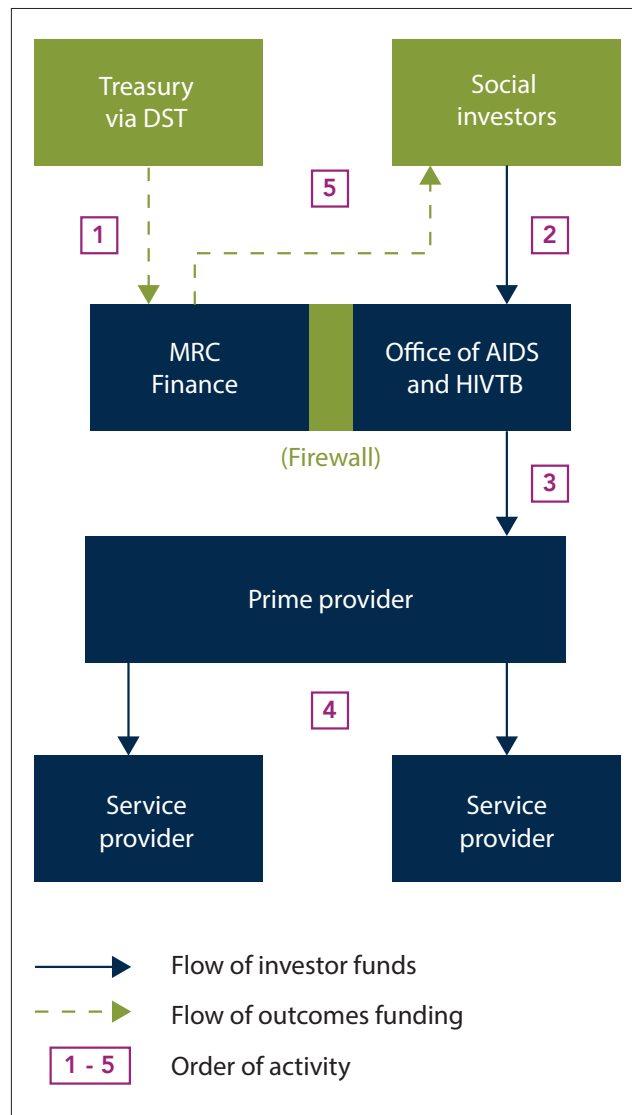


Fig. 3. SAMRC AGYW SIB structure. (DST = Department of Science and Technology; SAMRC = South African Medical Research Council; AGYW = adolescent girls and young women; SIB = social impact bond.)

The SIB ecosystem in SA

Two SIBs already exist in SA. The first SIB for early childhood education commenced in the Western Cape in 2017^[42] funded by the provincial Department of Social Development; and the second, the Bond4Jobs Pay for Performance initiative, has just been launched in Gauteng Province funded by the Jobs Fund. Following the global trend in the development of SIBs, a small group of local SIs have shown an interest in testing these instruments through the design phase and into implementation. The Bertha Centre for Social Innovation and Entrepreneurship at the University of Cape Town's Graduate School of Business has played a key role in popularising the concept and generating interest in the SIB concept. The SAMRC has engaged potential SA investors who have shown an interest in SIBs, and the general feedback has been that a substantial interest in investing in the AGYW SIB has been generated. A few international investors, mainly philanthropies, have also expressed interest.

The South African Treasury through the Department of Science and Technology, which is the department responsible for driving innovative financing, has played a major role in promoting the AGYW SIB and has made budgetary provisions for the SAMRC to fulfil the role of outcomes funder. Like other SIB models, initial financing for the AGYW SIB will be provided by socially motivated investors. Government, as the outcomes funder, motivated by paying for success and potential benefits in terms of improved social outcomes and lower health and social security costs, will only pay for the independently verified results, transferring the risk of failure of the programme to the investor.

SIs are motivated by the potential to achieve improved social outcomes and a reasonable return on investment. However, given that they are taking on the risk of programme failure, they will need to balance risks and returns and evaluate how to best manage and mitigate these risks before making an investment. Experience from the SIB market shows that different social areas have different levels of evidence and risk and, like commercial investment markets, different investors have different levels of risk tolerance and different return expectations and targets. Social impact investors such as philanthropies have a greater appetite for risk while seeking lower returns on investment, whereas finance-first investors will take a more conservative approach and elect to invest in SIBs, where the risk is lower and the returns more attractive. It is likely, then, that the AGYW SIB will be more attractive for the former category of investor.

Conclusion

The AGYW SIB conceives a situation where government will buy successful outcomes such as prevention of HIV or unintended pregnancy to achieve a social service objective of government, and where this will lead to the lower future costs of antiretroviral treatment in the case of HIV or lower health and social security costs in the case of unintended pregnancies. The social impact experienced by the individual, nonetheless, is the primary outcome.

SIs will hope to achieve a moderate financial as well as a social return on behalf of their shareholders or limited partners. As the field is nascent and SIs are not used to evaluating the delivery risk of social services, many of them are not prepared to absorb an increased level of risk without the commensurate increase in return expectations. Thus, until the market is established, philanthropic investment may be required to ensure that the cost of capital remains politically palatable.

SIBs are a new offering for governments in their obligation to provide social services to communities while transferring the risk of failure or lack of delivery to investors. For investors, the SIB opens new markets for investment that responds to their requirements for

their contributions to social development in a system that allows them to balance risk and return according to well-established rules of the market and governed by well-established market regulations. For implementers and beneficiaries, the SIB offers new investments in socially difficult areas that experience a dearth of funding in a way that focuses on outcomes and encourages ongoing innovation, adaptation and learning around effective programme delivery. The AGYW SIB described in this article will test the viability of this novel financing strategy for overcoming challenges in complex social interventions and may usher in a new era in this field of health and social programming. If there is a future for SIBs in healthcare in SA, the SAMRC is well placed to lead the way.

Acknowledgements. We thank Reshmi Dassaye for formatting this manuscript.

Author contributions. FA wrote the first draft of this manuscript and managed the preparation of subsequent drafts. TN, EN, EL, LV, SS, MR, NM, LD, MN, CM, TK, SDW, AK, and GG all contributed equally to the content and reviewed and edited multiple versions of the manuscript.

Conflicts of interest. None.

Funding. We acknowledge the support for development of the SIB provided by the Global Fund to Fight AIDS, TB and Malaria; the South African Department of Science and Technology; and the South African Medical Research Council.

1. Impact investment. 2019. <https://gsgii.org/> (accessed 1 July 2019).
2. Social impact bond at HMP Peterborough. <https://www.gov.uk/government/publications/social-impact-bond-pilot-at-hmp-peterborough-final-report> (accessed 1 July 2019).
3. The One Service was delivered by St Giles Trust, Ormiston Families, Sovo, MIND, TTT Training, YMCA and John Laing Training, and managed by Social Finance.
4. World's 1st Social Impact Bond. 27 July 2017. <https://www.socialfinance.org.uk/sites/default/files/news/final-press-release-pb-july-2017.pdf> (accessed 1 July 2019).
5. Brookings impact bond snapshot. 1 May 2019. <https://www.brookings.edu/wp-content/uploads/2019/01/Impact-Bonds-Snapshot-May-2019.pdf> (accessed 1 July 2019).
6. Chersich MF, Wabiri N, Risher K, et al. Contraception coverage and methods used among women in South Africa: A national household survey. *S Afr Med J* 2017;107(4):307-314.
7. Jonas K, Cruetzen R, van den Borne B, et al. Teenage pregnancy rates and associations with other health risk behaviours: a three-wave cross-sectional study among South African school-going adolescents. *Reprod Health* 2016;13(1):50.
8. Mchunu G, Peltzer K, Tutshana B, et al. Adolescent pregnancy and associated factors in South African youth. *Afr Health Sci* 2012;12(4):426-434.
9. Panday S, Makiwane M, Ranchod, C, et al. Teenage pregnancy in South Africa: With a specific focus on school-going learners. Pretoria: Human Sciences Research Council, 2009.
10. Dellar R, Waxman A, Karim QA. Understanding and responding to HIV risk in young South African women: Clinical perspectives. *S Afr Med J* 2015;105(11):952-956.
11. Christofides NJ, Jewkes RK, Dunkle KL, et al. Early adolescent pregnancy increases risk of incident HIV infection in Eastern Cape, South Africa: A longitudinal study. *J Int AIDS Soc* 2014;17:18585. <https://doi.org/10.7448/IAS.17.1.18585>
12. Maholo RB, Maja TMM, Wright SCD. Relationships, perceptions and the sociocultural environment of teenagers in Soshanguve Secondary School. *Afr J Midwifery* 2009;11(2):48-60.
13. Thembisa version 4.1: A model for evaluating the impact of HIV/AIDS in South Africa. https://www.thembisa.org/content/downloadPage/Thembisa4_1 (accessed 1 July 2019).
14. Dickson KE, Ashton J, Smith JM. Does setting adolescent-friendly standards improve the quality of care in clinics? Evidence from South Africa. *Int J Qual Health Care* 2007;19(2):80-89. <https://doi.org/10.1093/intqhc/mzl070>
15. Pettifor AE, MacPhail C, Bertozzi S, et al. Challenge of evaluating a national HIV prevention program: The case of loveLife, South Africa. *Sex Transm Infect* 2007;83(1):70-74. <https://doi.org/10.1136/sti.2006.023689>
16. Goldstein S, Usdin S, Scheepers E, et al. Communicating HIV and AIDS, what works? A report on the impact evaluation of Soul City's fourth series. *J Health Commun* 2005;10(5):465-483. <https://doi.org/10.1080/10810730591009853>
17. Johnson S, Magni S, Dube Z, et al. Extracurricular school-based social change communication program associated with reduced HIV infection among young women in South Africa. *J Health Commun* 2018;23(12):1044-1050. <https://doi.org/10.1080/10810730.2018.1544675>
18. Bekinska ME, Pillay L, Milford C, et al. The sexual and reproductive health needs of youth in South Africa – history in context. *S Afr Med J* 2014;104(10):676-678.
19. Johnson S, Magni S, Dube Z, Goldstein S. Extracurricular school-based social change communication program associated with reduced HIV infection among young women in South Africa. *J Health Commun* 2018;23(12):1044-1050. <https://doi.org/10.1080/10810730.2018.1544675>
20. Saul J, Bachman G, Allen S, et al. The DREAMS core package of interventions: A comprehensive approach to preventing HIV among adolescent girls and young women. *PLoS One* 2018;13(12):e0208167. <https://doi.org/10.1371/journal.pone.0208167>
21. The Global Fund Measurement Framework for AGYW Programs. 2018. [me_adolescentgirlsandyoungwomenprograms_frameworkmeasurement_en.pdf](https://www.gofund.org/adolescentgirlsandyoungwomenprograms_frameworkmeasurement_en.pdf) (accessed 1 July 2019).
22. Subedar H, Barnett S, Chaka T, et al. Tackling HIV by empowering adolescent girls and young women: A multisectoral, government led campaign in South Africa. *BMJ* 2018;363:k4585. <https://doi.org/10.1136/bmj.k4585>
23. Chimbindi N, Birdthistle I, Shahmanesh M, et al. Translating dreams into practice: Early lessons from implementation in six settings. *PLOS One* 2018;13(12). <https://doi.org/10.1371/journal.pone.0208243>
24. Kuruvilla S, Hinton R, Boerma T, et al. PMNCH Multisectoral Collaboration Study Group. Business not as usual: How multisectoral collaboration can promote transformative change for health and sustainable development. *BMJ* 2018;363:k4771. <https://doi.org/10.1136/bmj.k4771>

25. Gupta GR, Parkhurst JO, Ogden JA, et al. Structural approaches to HIV prevention. *Lancet* 2008;372(9640):764-775. [https://doi.org/10.1016/S0140-6736\(08\)60887-9](https://doi.org/10.1016/S0140-6736(08)60887-9)
26. Cluver LD, Orkin FM, Campeau L, et al. Improving lives by accelerating progress towards the UN Sustainable Development Goals for adolescents living with HIV: A prospective cohort study. *Lancet Child Adolesc Health* 2019;3(4):245-254. [https://doi.org/10.1016/S2352-4642\(19\)30033-1](https://doi.org/10.1016/S2352-4642(19)30033-1)
27. Stoner MC, Rucinski KB, Edwards JK, et al. The relationship between school dropout and pregnancy among adolescent girls and young women in South Africa: A HPTN 068 analysis. *Health Educ Behav* 2019;46(4):559-568. <https://doi.org/10.1177/1090198119831755>
28. Stoner MC, Pettifor A, Edwards JK, et al. The effect of school attendance and school dropout on incident HIV and HSV-2 among young women in rural South Africa enrolled in HPTN 068. *AIDS* 2017;31(15):2127-2134. <https://doi.org/10.1097/QAD.0000000000001584>
29. Ramraj T, Jackson D, Dinh T, et al. Adolescent access to care and risk of early mother-to-child HIV transmission. *J Adolesc Health* 2018; 62(4):434-443.
30. Yakubu I, Salisu WJ. Determinants of adolescent pregnancy in sub-Saharan Africa: A systematic review. *Reprod Health* 2018;15(1):15. <https://doi.org/10.1186/s12978-018-0460-4>
31. Maluleke R. Statistics South Africa. Demographic Profile for Adolescents in South Africa, Report No. 03-00-10 Statistician-General. Pretoria: Stats SA.
32. Chola L, Mcgee S, Tugendhaft A, et al. Scaling up family planning to reduce maternal and child mortality: The potential costs and benefits of modern contraceptive use in South Africa. *PLoS One* 2015;10(6):e0130077. <https://dx.doi.org/10.1371/journal.pone.0130077>
33. Adejumo, OA, Malee KM, Taiwo BO. Contemporary issues on the epidemiology and antiretroviral adherence of HIV-infected adolescents in sub-Saharan Africa: A narrative review. *J Int AIDS Soc* 2015;18:20049. <https://doi.org/10.7448/IAS.18.1.20049>
34. Enane LA, Davies M, Leroy V, et al. Traversing the cascade: Urgent research priorities for implementing the 'treat all' strategy for children and adolescents living with HIV in sub-Saharan Africa. *J Virus Erad* 2018;4(2):40-46.
35. Jewkes R, Dunkle K, Nduna M, et al. Factors associated with HIV sero-status in young rural South African women: Connections between intimate partner violence and HIV. *Int J Epidemiol* 2006;35:461-468. <https://doi.org/10.1093/ije/dyl218>
36. National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC), and ICF. 2018. South Africa Demographic and Health Survey 2016.
37. Crankshaw TL, Smit JA, Bekinska ME. Placing contraception at the centre of the HIV prevention agenda. *Afr J AIDS Res* 2016;15(2):157-162. <https://doi.org/10.2989/16085906.2016.1204330>
38. Campbell C, Foulis CA, Maimane S, et al. The impact of social environments on the effectiveness of youth HIV prevention: A South African case study. *AIDS Care* 2005;17(4):471-478. <https://doi.org/10.1080/09540120412331319705>
39. Bonner CP, Browne F, Ndirangu JW, et al. Exploring the associations between physical and sexual gender-based violence and HIV among women who use substances in South Africa: The role of agency and alcohol. *AIDS Care* 2019;31(11):1369-1375. <https://doi.org/10.1080/09540121.2019.1595512>
40. Parry CD, Blank MB, Pithey AL. Responding to the threat of HIV among persons with mental illness and substance abuse. *Curr Opin Psychiatry* 2007;20(3):235-241. <https://doi.org/10.1097/YCO.0b013e3280ebb5f0>
41. Probst C, Parry CDH, Rehm J. HIV/AIDS mortality attributable to alcohol use in South Africa: A comparative risk assessment by socioeconomic status. *BMJ Open* 2018;8(2):e017955. <https://doi.org/10.1136/bmjopen-2017-017955>
42. Proceedings of the International Conference on Business and Management Dynamics 2016: Sustainable Economies in the Information Economy. 2016. <https://www.gsb.uct.ac.za/PO-BC-early-childhood-dev-social-impact-bond> (accessed 1 July 2019).