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Boston University

Comparison of Key Unit Costs and Outcomes for Mobile and Fixed Site Screening / Testing Programs in Namibia

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Acknowledgments

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Executive Summary

Previous research on voluntary counselling and testing for HIV has shown a wide range of unit costs at fixed testing sites. In this study, we report on the unit costs of an innovative mobile screening program in Namibia (Bophelo!) which combined HIV screening with tests for eight other diseases or risk factors. These results are compared with unit costs for the fixed site Voluntary Counselling and Testing (VCT) program in Namibia, New Start, which is sponsored by United States Agency for International Development (USAID).

Bophelo! was created as a public private partnership between PharmAccess Namibia, the Namibian Business Coalition on AIDS (NABCOA) and the Namibian Institute of Pathology (NIP). After receiving clinic licenses from the Ministry of Health and Social Services in Namibia, the Bophelo! coalition began operating two mobile testing vans in 2009. The vans, which each house two counselling rooms, travelled to employment sites, and later remote farms and tourist lodges. There, employees were tested for HIV, cholesterol, blood glucose and haemoglobin levels, hepatitis B, syphilis, and hypertension. They were also asked screening questions for tuberculosis (TB). Employers paid a fee for the Bophelo! clinics to conduct on-site testing. Most of the remainder of Bophelo! costs were supported by a grant from the Global Fund.

Funded by USAID, IntraHealth operated a network of 18 fixed site New Start HIV testing centers throughout Namibia. Twelve of these are free standing sites while a further six are located on the premises of public or mission health providers. Testing at the sites is free, but patients must pay to travel to the site. In addition to HIV counselling and testing, New Start refers pregnant HIV positive women for Prevention of Mother to Child Transmission PMTCT (PMTCT) and asks screening questions on TB, STI’s and alcohol abuse.

Data were collected on patient volumes and costs at both New Start and Bophelo! for the full year 2009. Because Bophelo! was not in full operation until March of 2009, the
comparison below covers the full year for New Start and the period March to December 2009 for Bophelo!.

Table 1: Summary

<table>
<thead>
<tr>
<th></th>
<th>Bophelo!</th>
<th>New Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number testing for HIV</td>
<td>5,124</td>
<td>70,143</td>
</tr>
<tr>
<td>Percent male</td>
<td>64.2%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Number testing for HIV for first time</td>
<td>1,182</td>
<td>N.A.</td>
</tr>
<tr>
<td>Number testing HIV positive</td>
<td>537</td>
<td>7,365</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$310,451</td>
<td>$4,082,936</td>
</tr>
<tr>
<td>Private Contribution (employer payments)</td>
<td>$116,993</td>
<td>N.A.</td>
</tr>
<tr>
<td>Net public/donor costs</td>
<td>$193,458</td>
<td>$4,082,936</td>
</tr>
<tr>
<td>Cost per person tested for HIV</td>
<td>$ 60.59</td>
<td>$58.21</td>
</tr>
<tr>
<td>Cost per person testing for HIV for first time</td>
<td>$262.65</td>
<td>N.A.</td>
</tr>
<tr>
<td>Cost per person testing positive for HIV</td>
<td>$578.12</td>
<td>$557.09</td>
</tr>
<tr>
<td>Public cost per person tested</td>
<td>$37.76</td>
<td>$58.21</td>
</tr>
<tr>
<td>Public cost per person tested for HIV for first time</td>
<td>$163.67</td>
<td>N.A.</td>
</tr>
<tr>
<td>Public cost per person testing HIV positive</td>
<td>$360.26</td>
<td>$557.09</td>
</tr>
</tbody>
</table>

Costs shown are in US dollars

The above summary shows that the mobile testing program was only slightly more expensive for each person tested than the fixed site testing program. This difference was largely explained by a difference in price for VCT testing kits, which were available less expensively to New Start through the USAID sponsored Supply Chain Management System. Employers paid for over one third of Bophelo! costs, so the public sector costs per person tested by Bophelo! were substantially lower than those at New Start. The patients screened incurred no costs at Bophelo!, since the clinic came to the work site and those being tested did not have to pay for travel or take time off from work.

At an incremental cost of only US$11.35 (18.7%), Bophelo! screened for the eight additional diseases and conditions besides HIV. Over half of persons (50.6%) tested had at least one of these conditions. All patients were referred for follow up care—those who were insured to private doctors, others to Ministry of Health and Social Services(MoHSS) facilities.

1 All data for Bophelo! for period March to December 2009
2 All New Start data for twelve months, January to December 2009
The study shows the advantages of both mobile multi-disease screening and a strong public private partnership. Proportionately more men were reached by Bophelo!. In part, this is because the work force at the sites visited was disproportionately male. But the convenience of testing at work, and the fact that eight conditions in addition to HIV were screened, may have induced men to test who thought they were not at risk of HIV infection, or who would be reluctant to seek out an HIV testing site.

Those tested by Bophelo! incurred no out of pocket costs. When Bophelo! shifted to testing at remote farms and tourist lodges in November and December 2009, unit costs were somewhat higher, but the proportion testing for the first time was also much higher. Bophelo! was reaching those reluctant to test or unable to do so because of the cost and difficulty of travelling to a fixed testing site.

The public/private partnership embodied in Bophelo! mobilized employer funds, reducing the public/donor cost per test below that for the New Start facilities. The management flexibility inherent in private sector operation likely contributed to controlling unit costs. Bophelo! appears to be a useful model to screen populations for HIV and other critical chronic diseases anywhere in Africa, but particularly where formal sector employment is substantial and some populations are remote and difficult to reach.
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1. Background

1.1. Introduction
The Bophelo! partnership consists of PharmAccess Foundation, the Namibia Business Coalition on AIDS (NABCOA) and the Namibian Institute of Pathology (NIP). Since the beginning of 2009, two mobile clinics run by this partnership have been in operation to provide wellness testing for companies in Namibia. The program is unique both because it provides mobile screening for a number of conditions including HIV infection, and because it is supported by both public funds and private (employer paid) user fees. There is an interest from the partners as well as the wider national and international health community to evaluate the unit costs and funding of this mobile multi-disease screening program in Namibia, and where possible, to provide a comparison with the costs of fixed site testing.

1.2. Study questions
The study addresses the following questions:

- **What is the full cost of operating a mobile, multi disease screening program in Namibia?**
  A full cost analysis will show the cost per unit for each of the following measures:
  - Cost per patient (all patients screened)
  - Cost per patient screened for HIV
  - Cost per patient screened for the first time for HIV
  - Cost per patient newly identified as HIV positive

- **What is the value of the private (employer fee) and public (donors and Namibian Government) contributions to the cost of the Bophelo! program?**

- **Is mobile screening more or less efficient than fixed site screening for HIV infection?**

- **Is Bophelo! more effective at reaching out to groups that are unlikely to seek VCT?**
  We hypothesize that the mobile multi-disease screening approach may attract many who have not tested before for HIV, or who do not believe they are at risk for the disease. Data on “first time testers” can be used to examine this hypothesis.

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3 Some patients decline the HIV test but accept screening for other diseases/conditions in the mobile Bophelo! clinic. Anecdotally, we know that a number of those who decline already know that they are HIV positive, and some are in treatment.
1.3. Bophelo!

Since 2006, PharmAccess Foundation, in collaboration with the Namibian Business Coalition on AIDS (NABCOA) and the Namibian Institute of Pathology (NIP), has conducted anonymous HIV seroprevalence surveys of Namibian workers. The three organizations are referred to hereafter as the Bophelo! partners (“the Partners”). The surveys were conducted at employment sites and paid for by the employers. After reviewing the results of these tests, the Partners concluded that there was a need to bring VCT to Namibian employment sites. Under the regulations of the MOHSS, VCT can only be conducted at a licensed clinic/rapid testing site. The Partners decided to create mobile testing clinics which would meet MOHSS licensing requirements. They also decided to include screening for a wider range of diseases. In this way, a patient would not be identifying him or herself as being at risk for HIV infection, as might be the case in attending a VCT clinic. It was hoped that this would reduce stigma and increase uptake of counselling and screening.

The partners initially created the Bophelo! project, using funding from the Dutch Postcode Loterij and the Global Fund for AIDS, TB and Malaria (GFATM). The terms of the Partnership are documented in a Memorandum of Understanding signed by the partners in December 2009 and attached as Appendix One. PharmAccess and NABCOA each built a mobile screening van to a common design, mounted on a truck chassis, and containing two examination rooms, toilet facilities and all of the equipment necessary to provide patient education and confidential counselling and conduct screening tests for the following conditions:

- Hypertension (blood pressure)
- Elevated glucose levels (rapid test)
- Elevated cholesterol (rapid test)
- Haemoglobin levels (rapid test)
- Weight, height, waist circumference and body mass index
- HIV (rapid test)
- Hepatitis B (rapid test)
- Syphilis (rapid test)
- TB (symptom screening questions)

At the beginning of 2009, MOHSS granted conditional licenses to the two Bophelo! vans, and they began visits to Namibian employment sites. PharmAccess employed the testing and counselling staff, and scheduled and managed the vans. NABCOA provided outreach services to encourage companies to use the Bophelo! van. NIP provided quality assurance, including retesting of a 5% sample of on-site results. Employers pay a fee, while the Global Fund covers the remainder of the cost for PharmAccess and NABCOA. NIP is currently contributing its quality control services to the partnership. In addition, funding from donors was obtained through the Dutch government to kick start the project.

As part of the Bophelo! screening process, PharmAccess collects a number of data elements on socioeconomic and risk factors for each person screened. This information,
along with all of the test results, is entered into a database maintained by PharmAccess. Individual identifiers are not included in the database, the data is fully anonymous. By mid-December 2009, around 6,000 people had been screened by the Bophelo! vans, with data on identified conditions and risk factors entered into the database.

In November 2009, the Bophelo! vans moved beyond concentrated employment sites and began a pilot screening at remote farms and tourist facilities in Namibia. During this pilot, the dependents of the farm workers were also offered screening. In contrast to providing testing at companies in urban surroundings, the circumstances in the rural area were quite different, leading to high transport costs due to the longer distances.

Patients who test positive for any condition are urged to seek follow up consultation and care. Those with medical scheme coverage are encouraged to see a private provider. Clients that need further treatment are given a standard MOHSS referral letter. The referral letter indicates the condition(s) detected. In addition, the Bophelo! counselor gives the patient a form coded with the same number as the testing information but without identifying information, which is meant for the employer. This form does not identify the condition(s) detected, but allows the employee to request time off so that all employees with a referral letter can seek consultation. This latter form (without diagnosis, and only containing the case number) is to be signed by the provider and returned to the employer as evidence that the employee did seek medical consultation.

1.4. New Start Centres
IntraHealth International is a USA based company working in Namibia under PEPFAR (through USAID) supporting a network of 18 VCT centres across Namibia, under the New Start franchise. It incorporates all three models of service delivery, namely; freestanding/stand alone, integrated, and mobile/outreach.

Freestanding/standalone sites provide VCT services from a permanent site not connected with a health facility. These sites are dedicated to providing VCT services, with supplementary screening for alcohol abuse, TB and STI’s and referral of HIV positive pregnant women for PTMCT. These twelve free standing sites make referrals for follow up care at the appropriate public health facility.

Integrated sites offer VCT services as part of an integral medical package from a health facility such as a hospital or health centre. Six such sites are located at health facilities in Andara, Nyangana, Oshikuku, Rehoboth St. Mary’s Hospital, Onandjokwe and Odibo.

Some New Start Centres provide mobile outreach services, using tents or available community structures for the counselling rooms. However, at the moment the outreach operations are limited and no separate costs are reported for this.

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4 A system has been put in place where the employers are requested to return the form that has been signed by the health provider to NABCOA, so that Bophelo! can estimate follow up rates. However, at the time of writing this system is not yet fully operational.
All centres follow the same protocol: clients first receive pre-test counselling after which the test takes place. They then return to the waiting room and receive their results in around 20 minutes, followed by post-test counselling. If the client is HIV positive, a referral form to the local hospital is provided. As with Bophelo!, New Start’s service is anonymous and confidential – data is collected, but only on an anonymous basis.

Many New Start Centres work in partnership with faith-based or community organisations, and all report to IntraHealth. IntraHealth is responsible for the overall operation of all New Start Centres, data collection and funding (provided through a USAID contract).

1.5. Study sponsorship
This study was supported with funds from USAID Associate Award GHO-A-00-08-00001-00 under Leader GHS-A-00-03-0020-00. The funding was awarded by the USAID Office of HIV/AIDS for the development and/or evaluation of public private partnerships for the prevention and treatment of HIV/AIDS.

1.6. Study participants
The following participants have been involved in this study:

*Boston University School of Public Health, Department of International Health, Center for Global Health and Development*
Boston University provided overall leadership and responsibility for the design and implementation of the research.

*PharmAccess Foundation Namibia*
As a key partner in the Bophelo! partnership responsible for the operations of the mobile clinics, PharmAccess Foundation Namibia provided the following data:
- key data on all people tested, such as number of people tested positive and if they have ever tested for HIV before
- demographic data on all people tested
- operational cost information
- funds received from employers and donors
In addition, under a subcontract with Boston University, PharmAccess retained a costing expert to extract the financial data from all Bophelo! partners and New Start.

*NABCOA*
The Namibia Business Coalition on Aids (NABCOA) is one of the Bophelo! partners. NABCOA provided information on their costs incurred for part of the operations (one of the mobile clinics is owned by NABCOA) as well NABCOA’s outreach and marketing activities to encourage the use of Bophelo!.
**NIP**
The Namibia Institute of Pathology (NIP) is also a Bophelo! partner. NIP provided information on the costs for the quality assurance services and certain incidental support supplied to Bophelo!.\(^5\)

**IntraHealth - New Start Centres**
IntraHealth is responsible for the running of the New Start Centres in Namibia. IntraHealth provided the following information:
- key data on the number of persons tested
- operational cost information
- data on follow up tests for negative patients who may be in a “window period” after a recent risk of infection.
- data on male/female ratio of people tested

Data on the costs of marketing and promotion of the New Start Centres was provided by Nawa Life. Data on the costs of test kits and other consumables associated with the test kits was provided by Supply Chain Management System (SCMS). Both Nawa Life and SCMS are prime partners of USAID and provide services directly to IntraHealth, funded through USAID.

### 1.7. Approvals
The following institutions have provided approval for this study:
- Institutional Review Board, Boston University Medical Center
- Ministry of Health and Social Services, Namibia

Copies of the provided approvals are included in Appendix Two and Three.

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\(^5\) NIP currently supplies secure parking for Bophelo! vehicles.
2. Approach

2.1. Introduction
The study was designed by Boston University School of Public Health, in cooperation with PharmAccess Foundation Namibia. The draft study design was shared for comments with the Bophelo! partners, the Ministry of Health and Social Services in Namibia, IntraHealth and USAID.

2.2. Data collection

Timing
All data regarding New Start included in this evaluation, both cost data and data on number of people tested, relates to the running of the New Start Operation from January 2009 until December 2009.

All data regarding Bophelo! included in this evaluation, both cost data and data on number of people tested, relates to the running of the New Start Operation from March 2009 until December 2009. This time period was chosen because the project was not in full operation in January and February; not all staff had been hired and only pilot testing took place.

Costs for management and staffing in previous years associated with planning and setting up the Bophelo! or New Start programmes have not been included. The physical collection of data was performed from February 2010 to May 2010.

Costing approach
The underlying principle of this study is to obtain and allocate the full direct cost of all resources actually used by the Bophelo! and New Start programs in 2009. This includes depreciation of capital investment and the market value of any services or goods that were provided for free by any of the donors or Bophelo! partners. However, it does not include the costs of preparation and planning in previous years.

Data sources
Data was collected through the following sources:

- PharmAccess Foundation (PAF):
  - General ledger: PAF tracks all expenses for the Bophelo! project.
  - Overview of all salaries (including overtime) paid to Bophelo! staff.
  - Log books of vans containing the number of kilometres driven in 2009
  - Petty cash register
  - Overview of all invoices to PAF
  - Overview of all overhead costs
  - Overview of funds received from NABCOA for Bophelo!
  - Invoices supplied to companies and overview of received payments
  - Discussions with Bophelo! operations manager and PAF accountant
- **NABCOA:**
  - General ledger: NABCOA tracks all expenses of the Bophelo! Project
  - Discussions with NABCOA accountant, dedicated Bophelo! staff member and NABCOA general manager.

- **Namibia Institute of Pathology**
  - Discussions with NIP staff: Manager Quality Assurance, Manager Corporate Affairs and medical and laboratory technicians
  - Overview of costs provided by NIP

- **IntraHealth**
  - Financial data provided by the Financial Director of IntraHealth on New Start staffing, operations and other costs
  - Data on the number of people tested and male/female ratio provided by the Technical Director of IntraHealth
  - Discussions with IntraHealth staff: Financial Director, Technical Director.

- **Supply Chain Management System (SCMS)**
  - SCMS provides the test kits to the New Start Centres and is paid directly by USAID. SCMS provided an overview of the costs and quantities of all goods supplied to IntraHealth during the time October 2008 until September 2009. Although this is a different time period to the study, SCMS assumed that the same amount of test kits would have been used from January 2009 until December 2009.

- **Nawa Life**
  - NAWA life provides the marketing activities for the New Start Centres and is paid directly by USAID. Nawa Life provided an overview of all their activities and costs related to the New Start Centres for January 2009 until December 2009.

### 2.3. Cost categories and assumptions

**General**

**Exchange rate**
The average exchange rate of the US dollar and the Namibian dollar for 2009 has been used: 1 US dollar = 8.43 Namibian dollars. To calculate this average, the historical data on exchange rates held by the South African Reserve Bank was used.\(^6\)

**VAT**
All amounts in this evaluation are exclusive of VAT\(^7\), except where VAT would not be claimed back. This is for example the case for some PharmAccess expenses, such as dry cleaning and accommodation.\(^8\). In addition, for the New Start Centres it was assumed that only 10.0% of all VAT paid was actually claimed back during 2009.

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\(^6\) See [http://www.reservebank.co.za/](http://www.reservebank.co.za/). The South African Reserve Bank collects data on historical exchange rates against the South African Rand. As the Namibian dollar is pegged to the SA Rand, the same exchange rate has been used.

\(^7\) VAT in Namibia is 15.0%.
Operations

Personnel cost
Personnel costs are included according to the percentage of time spent on Bophelo! or New Start activities. For Bophelo!, we assumed that the coverage of additional diseases required more time for training, reporting, project management and senior management than in the situation where Bophelo! would have only tested for HIV. The assumption is that if Bophelo! had only tested for HIV, all staff time (excluding driver’s staff time) and training expenses would be 15.0% less than the reported costs for the overall screening programme.

Travel and per diem cost
Travel and per diem cost have been obtained directly from the relevant organisations, with the exception of the travel and per diem costs for the quality control checks for the New Start Centres. The cost for these visits was calculated using the distance of the centres to Windhoek, with the assumption that staff would travel maximum 800 kilometres per day and would receive N$ 150.00 / US$ 17.81 per day as a daily allowance.

Accommodation costs
Wherever possible, the real costs spent on accommodation have been obtained directly from the relevant organisations. For NIP staff making quality control checks, an average cost of N$ 450.00 / US$ 53.00 has been assumed per night of accommodation. The number of nights is based on the maximum travel time of 800km per day and an inspection lasting around 5 hours per site.

Maintenance cost for mobile clinics
For the mobile clinic owned by PharmAccess, the real maintenance costs were included, which exceeded the maintenance provision. For the mobile clinic owned by NABCOA, the provision was included, as no maintenance costs have been incurred. As these maintenance costs will be incurred shortly, it was agreed to use as a cost the maintenance provision set up by NABCOA.

Maintenance costs of buildings owned by the New Start Centres
The assumption is that the maintenance for the buildings of all New Start Centres has been included in the overall operational costs.

Test kits
For Bophelo!, the average cost of test kits has been obtained through a review of the invoices for test kits in 2009. The rate per HIV test kit including consumables for Bophelo! is N$ 46.74 / US$ 5.55. For New Start, the standard rate was N$ 28.09 / US$ 3.33, including consumables, as reported by their procurement agency, SCMS. The overall costs of the test kits was obtained by multiplying the cost of a test kit for each organisation by the number of people tested, and including a contingency for wastage of 10%.

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9 NABCOA makes a maintenance provision of N$ 3,000 a month, around US$ 356 per month.
Secure parking
Currently, secure parking for the two mobile clinics is provided free of charge by NIP. Due to the limited offering of secure parking for medium sized vans, no quotations for secure parking for mobile clinics were available. However, cost information was obtained on the cost of secure parking near PharmAccess’ office. The assumption made is that parking would be three times the cost of parking a normal car in a secure parking area.

Depreciation of mobile clinics
It is assumed that the Bophelo! vehicles have a life span of five years, with zero salvage value. The initial investment of transforming the vans into mobile clinics has been included in the capital cost of the vans.

Some New Start Centres own multiple vehicles, whereas other New Start Centres use cars of other organisations and incur a usage charge which is included in the operational costs reported in this study. All cars that are owned by the centres are older than five years and have been fully depreciated. Therefore, no cost for depreciation of these cars has been included.

Depreciation – New Start Centres
Where New Start pays rent, this is taken as the annual cost of occupying the New Start Centre. Eight of the 18 New Start Centres currently do not pay rent, as the organisations hosting these New Start Centres own the buildings. We therefore estimate depreciation to develop the annual occupancy cost for these eight sites. Depreciation for each facility was calculated on the basis of an average surface space of 300 square m2 and four gravel parking spaces of 10M2. Using an average building rate of N$ 4,800 / US$ 570 per M2, the assumed build cost is N$ 1,476,400 / US$ 175,156.49 per centre. Furthermore, a life span of 40 years was assumed, with zero salvage value. We assume that each centre is equipped with standard furniture (approx. 20 chairs, 5 desks, 2 tables) for N$ 28,500 / US$ 3,381.17 with a life span of 8 years with zero salvage value. In addition, the assumption has been made that each centre owns office IT equipment consisting of four computers, one copier, one printer, one fax and four phones. In total it has been assumed that the value of this would be N$ 46,000 / US$ 5,457.33 with a life span of 3 years and nil salvage value.

Overhead
For each organisation, the overhead charge was dealt with differently. For PharmAccess, the real overhead was included, based on a PharmAccess overview of all overhead costs of 2009. For NABCOA, the organisation’s standard overhead charge of 10% was included. For both these organisations the management time spent on the projects has been included separately, and is thus not included in the overhead charge. For NIP an overhead charge of 30% was calculated on the costs included as the NIP cost overview excludes charge for management time, except for the time spent directly on meetings.

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10 Based on data from Jordaan Oosthuysen Nangolo, a local construction engineering company. This rate includes allowances for carpets, wallpaper, lighting and air-conditioning.
11 With the exception of test tariffs, as these already include cover for overhead
12 Although NIP cost data includes the time of management spent on meetings for the Bophelo! partnership, no other management time has been included for the overall running of their organisation.
IntraHealth reported a standard overhead charge under its USAID contracts of 30.89%. No overhead was calculated for Nawa Life (responsible for promotion) and SCMS (procurer of test kits) as their rates already include overhead charges.

Management time – Bophelo! partnership
Each partner organisation was requested to provide an estimate of the time that management was involved in the operation of Bophelo!. It was assumed that at a minimum, management would attend monthly meetings of 2 hours, with 1 hour follow up and preparation.

Marketing
For Bophelo!, the costs of marketing have been included as collected through NABCOA and PharmAccess. The costs associated with the launch of the Bophelo! programme in March have been excluded, as this cost is considered as part of the preparation of the programme. For IntraHealth, all marketing activities are performed by Nawa Life, which provided the cost data on their activities.

Outreach operations New Start Centres
Several New Start Centres operate outreach services on an ad hoc basis. IntraHealth reports that the outreach operations are minimal and incremental costs of moving staff offsite for such sessions are negligible. In addition, it was not possible to separate the costs or number of people tested during outreach visits.

Contributions to New Start Centres from other donors
Many New Start Centres work together with faith-based or community organisations. IntraHealth provides the funding for the operation of the testing centres, but is aware that in some cases other organisations donate time, money or goods to the New Start Centres. We assume that the value of this contribution represents 5% on top of the operational costs reported by IntraHealth.

Quality Control
Quality control for both mobile and fixed site screening is performed by the Namibia Institute of Pathology. As no recent invoices are available, we agreed with NIP to use its tariffs for standard tests/activities where available and to work out the cost price where tariffs are not available.

Preparation of tests and executing tests
Where NIP publishes a tariff for a test, this tariff has been used, with a discount of 20%, similar to that granted by NIP to large customers such as MOHSS. Where no tariff was available, an assumption was made based on discussions with the NIP technicians and management regarding time and consumables required. Standard salary scales supplied by NIP for technicians and management were used.

13 The costs of the launch constitute 1.6% of the overall costs. If these costs are included the cost per person tested for HIV is US $1.21 higher than if these costs are excluded.
14 Under the Memorandum of Understanding, NIP provides its services for free to Bophelo! Furthermore, IntraHealth noted that they have not received an invoice for the past two years.
On site inspection
An on-site inspection is required for the initial certification, and annually thereafter for the re-certification every two years. It has been assumed that this takes five hours for the two mobile clinics, and similarly five hours for each New Start Centre.

Quality control by Council of Churches in Namibia (CCN)
IntraHealth reported that part of their quality control is done by CCN instead of NIP. As no cost estimates have been provided for this service, the assumption has been made that the costs would be similar to a situation where NIP would provide full quality assurance.

Data on people tested

Bophelo!
Data on Bophelo! was collected through PharmAccess’ database on all people tested during 2009. This anonymous database includes full information on:
- the number of people tested,
- the number of people testing positive for various condition,
- the number of people who stated that they are already HIV positive,
- the number of people stating that are already on ART
- the number of people who had tested for HIV before.
In addition, this database holds information on the demographics of the people tested. All data is collected anonymously and no identifiers are included in the database.

New Start data
Data on the New Start Centres was collected through New Start’s head office, which provided:
- the total number of people tested per centre,
- the number of people tested positive per centre and
- the number of people that returned for re-testing within the 3-month window period.
The data includes the people tested during the National Testing week.

Client company contributions
All company payments for Bophelo! services are based on the amounts paid to PharmAccess for services delivered from March until December 2009 for HIV testing – any amounts paid specifically for wellness testing (for conditions other than HIV) have been excluded. Although PharmAccess charges VAT to the companies, for the purpose of this study VAT has been excluded from the company contributions as the companies would be able to claim the VAT contribution back from the Ministry of Finance.15

2.4. Data analysis
Before data was analysed, quality control checks were performed on the data:

15 PharmAccess will charge and collect VAT on the fees charged for its services. PharmAccess will pay VAT on the services that it buys. The net difference between the collected VAT and paid VAT is paid to the Revenue Authority or claimed back from the Revenue Authority at the end of each tax period.
Comparison of gathered data with available cost data. For example the expenses on fuel were compared with the kilometres noted in the logbooks multiplied by the current fuel charge, and the costs of NABCOA and PharmAccess were compared to note any omissions or discrepancies.

Following on from this, further checks were done on items that appeared inconsistent. For example, invoices were compared with items booked in the PharmAccess' general ledger for Bophelo!

A sensitivity analysis has been done on the separate cost categories. This showed that for Bophelo! there are three cost categories that together account for more than half of the total costs.

After the quality control check, the Bophelo! data was split into different time periods:

- From January through October, and for November and December. In the last two months of 2009, Bophelo! mainly tested rural communities. With the high costs of travel and accommodation in the latter period, we expected the cost per person tested to be higher.

- For January and February, and from March through December. The Bophelo! operation only reached full speed in March, so unit costs may have been higher in the earlier start up period.

Subsequently, the data was analysed using an Excel model (Appendix Five) specifically designed for this purpose. Using this model, an overview was made of the different cost categories and their relative importance to the overall costing. In addition, the model provides an overview of the unit cost for a range of alternative output measures: such as the cost per person screened for HIV and the cost per newly identified HIV infected person.

2.5. Existing literature on VCT unit costs

No information was found regarding the unit costs of mobile HIV testing clinics that also include screening for other diseases, but several studies provide information regarding the unit costs of VCT. However, as recognised by Walker (2003) and McConnel et al (2005), the comparability of the existing data is questionable, as estimates vary wildly. For example, unit cost estimated varied between US$ 1.50 in Russia in 2003/2004 (Marseille et al, 2007), an average of US$ 10.60 in 2005 comparing 60 studies (Schwartlander et al, 2005), to averages of US$ 26.65 in Kenya (1995 – 1998), US$ 28.93 in Tanzania (1995 – 1998) (Sweat et al, 2000), to US$ 47.34 in 1999 In Kenya (Forsythe et al, 2002) and US$ 101.58 per client in South Africa in 2003 (McConnel et al, 2005).

There is some recent information available on the costs of fixed site and mobile VCT. Menzies et al (2009), working in Uganda, compared the unit costs in a period between 2003 and 2005 for four methods of HIV testing, including hospital based testing and testing of household members of HIV positive cases. Stand alone fixed site VCT cost $19.26 per person tested and $100.59 per HIV-positive individual identified. Door to door VCT was less expensive per person tested ($8.29), but more expensive for each HIV positive client identified ($163.93). In Kenya, Grabbe and colleagues (2009) found that
the unit cost of mobile testing in 2005-2006 averaged $14.40 per client tested; $151.62 per HIV positive, and $177.23 for each newly identified positive case. In the same study, stand alone fixed site VCT clinics cost $23.62 per client, $171.07 per HIV positive client, and $474.68 per newly identified HIV positive.

Using inflation data on average consumer prices, the units costs reported in the literature would represent the following unit costs in 2009:

<table>
<thead>
<tr>
<th>Year of research</th>
<th>Time period considered</th>
<th>Number of people tested</th>
<th>Unit cost in year of research (US$)</th>
<th>Unit cost in 2009 (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia 2003/2004</td>
<td>NA</td>
<td>NA</td>
<td>1.50</td>
<td>2.86</td>
</tr>
<tr>
<td>India 2005/2006</td>
<td>1 year</td>
<td>66,445</td>
<td>3.33</td>
<td>4.17</td>
</tr>
<tr>
<td>Average of 60 studies</td>
<td>2005</td>
<td>NA</td>
<td>10.60</td>
<td>12.41</td>
</tr>
<tr>
<td>Tanzania 1995 - 1998</td>
<td>1 year</td>
<td>***601</td>
<td>28.93</td>
<td>58.41</td>
</tr>
<tr>
<td>South Africa** 2003</td>
<td>1 year</td>
<td>662</td>
<td>53.02</td>
<td>66.84</td>
</tr>
<tr>
<td>Kenya 1995 - 1998</td>
<td>1 year</td>
<td>***716</td>
<td>26.65</td>
<td>71.91</td>
</tr>
<tr>
<td>Kenya 1999</td>
<td>2 months</td>
<td>423</td>
<td>47.34</td>
<td>120.74</td>
</tr>
<tr>
<td>Kenya (mobile) 2005-2006</td>
<td>1 year</td>
<td>45,539</td>
<td>14.40</td>
<td>15.32</td>
</tr>
<tr>
<td>Kenya (fixed site) 2005-2006</td>
<td>1 year</td>
<td>14,634</td>
<td>23.62</td>
<td>25.13</td>
</tr>
<tr>
<td>South Africa* 2003</td>
<td>1 year</td>
<td>662</td>
<td>101.58</td>
<td>128.06</td>
</tr>
<tr>
<td>Uganda (fixed site) 2003-2005</td>
<td>6-12 months</td>
<td>9,604</td>
<td>19.26</td>
<td>21.87</td>
</tr>
<tr>
<td>Uganda (door to door) 2003-2005</td>
<td>6-12 months</td>
<td>49,470</td>
<td>8.29</td>
<td>9.41</td>
</tr>
</tbody>
</table>

* average of study period
** last quarter of study period
***This is the number of participants. However, the study also states that the costs are based on a free-standing clinic with capacity to process 3,000 clients per year (Sweat et al, 2000).

It is clear from this table that the range of reported unit costs is very broad. Costs for test kits have fallen over the period since 1990, but wages will have risen. The amount of time considered adequate for counselling will have cultural variations (and may explain the low cost in Russia). Unit costs are clearly sensitive to the volume of the program, the location of the testing sites, and the willingness to be tested.

Certain cost studies provide a break down into different categories, which all reveal the same structure: staff costs usually constitute by far the largest amount, followed by costs

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16 Some mobile testing was done in mobile containers similar to Bophelo! that were moved from site to site and left for periods of a week or two; in others, a team of testers moved from site to site without dedicated clinics.

17 The authors speculate that this may be because of a significant number of “repeat” testers at stand alone VCT sites.

18 IMF, www.imf.org

19 For India and South Africa the costs were calculated back to the original local currency equivalent. Subsequently, CPI inflation figures were used to calculate the unit cost in 2009, and then transferred to US dollar using the average 2009 US exchange rate. For the other countries the foreign exchange fluctuations were not included in the calculations.
of recurrent goods, such as HIV test kits. See the table below, which provides an outline of five studies.

### Table 3: Cost categories in previous studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Staff as % of total cost</th>
<th>Recurrent goods as % of total costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dandona et al, 2008</td>
<td>India</td>
<td>47%</td>
<td>37%</td>
</tr>
<tr>
<td>McConnel et al, 2005</td>
<td>South Africa</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Sweat et al, 2000</td>
<td>Kenya</td>
<td>49%</td>
<td>25%</td>
</tr>
<tr>
<td>Sweat et al, 2000</td>
<td>Tanzania</td>
<td>55%</td>
<td>24%</td>
</tr>
<tr>
<td>Forsythe et al, 2002</td>
<td>Kenya</td>
<td>59%</td>
<td>38%</td>
</tr>
</tbody>
</table>

2.6. Limitations

Information on the Bophelo! programme was readily available and in a clear format, with the researcher having free access to all cost data and all data collected during 2009 on Bophelo! clients. Relatively few assumptions were necessary; parking of the Bophelo! vans, quality control activities and the useful life and salvage value of the vans were the few exceptions. Of these, only the depreciation assumption accounts for more than 1% of the total costs of the Bophelo! operation.

As many New Start Centres are run by other organisations, New Start does not have a complete overview of the goods and services that these organisations provide to the New Start Centres. Although 5.0% was added on top of the operation costs to allow for contributions by other organisations, it is difficult to judge the accuracy of this figure without researching every centre, which is outside of the scope of this research.

In addition, it was not possible to segregate IntraHealth’s costing for more specific categories; ‘other operational costs’ provided was 15.3% of all IntraHealth costs. This has limited the researcher’s ability to investigate the different items included in this category and spot any omissions or discrepancies.

As detailed above, assumptions were made for New Start with regard to the depreciation of existing buildings, vehicles, furniture and equipment, totalling 9.2% of all costs.
3. Costs of mobile HIV/AIDS screening in Namibia

3.1. Introduction
Currently, the Bophelo! clinics are the only mobile clinics in Namibia that specifically target companies and their employees for testing on HIV/AIDS and other diseases. This chapter will outline the results and the costs of the activities in 2009.

3.2. Number of people screened and prevalence

From March through December 2009, 5,734 clients were screened in the Bophelo! clinics for a range of diseases. Of the total number of clients, 10.6% refused to undertake a HIV test, leading to a total of 5,124 clients tested for HIV, as illustrated in Table 4. The population tested shows a prevalence of 10.5% compared to an estimated HIV prevalence of 13.3% among adults in Namibia. However, some of those who declined the HIV test but took the other screening tests likely knew they were HIV positive, so the HIV rate in the total population screened could be somewhat higher than shown here.

Table 4: Number of people screened in March - December 2009 (Bophelo!)

<table>
<thead>
<tr>
<th>Number of people screened</th>
<th>As % of total number of people tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people screened</td>
<td>5,734</td>
</tr>
<tr>
<td>Number of people tested for HIV</td>
<td>5,124</td>
</tr>
<tr>
<td>Number of people tested for HIV for the first time</td>
<td>1,182</td>
</tr>
<tr>
<td>Number of people tested positive</td>
<td>537</td>
</tr>
<tr>
<td>Number of people tested positive for the first time</td>
<td>421</td>
</tr>
</tbody>
</table>

In total 10 organisations from the agricultural, services, utilities, multi-industry and transport sectors were screened, as indicated in Table 5 below. It should be noted that the third agricultural organisation listed represents an agricultural union, consisting of multiple smaller farmers. The agricultural organisations were tested in the last two months of 2009, when the mobile clinics were used for a rural pilot.

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20 Reasons provided for not undertaking a test were: not ready (49%), already knows status (44%), HIV positive (7%).
21 Estimated adult HIV prevalence derived from the UNAIDS Spectrum Model, see HIV and AIDS Partnership Framework 2011 – 2016, 2010
Table 5: Overview of sectors and company size

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry</th>
<th>Number of people tested</th>
<th>Size of company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture</td>
<td>72</td>
<td>50 – 100</td>
</tr>
<tr>
<td>2</td>
<td>Agriculture</td>
<td>24</td>
<td>10 – 50</td>
</tr>
<tr>
<td>3</td>
<td>Agriculture</td>
<td>372</td>
<td>0 – 10</td>
</tr>
<tr>
<td>4</td>
<td>Multi-industry</td>
<td>3363</td>
<td>&gt;2000</td>
</tr>
<tr>
<td>5</td>
<td>Services*</td>
<td>35</td>
<td>50 – 100</td>
</tr>
<tr>
<td>6</td>
<td>Transport</td>
<td>111</td>
<td>1500 – 2000</td>
</tr>
<tr>
<td>7</td>
<td>Transport</td>
<td>268</td>
<td>250 – 500</td>
</tr>
<tr>
<td>8</td>
<td>Transport</td>
<td>225</td>
<td>250 – 500</td>
</tr>
<tr>
<td>9</td>
<td>Utilities</td>
<td>747</td>
<td>500 – 1000</td>
</tr>
<tr>
<td>10</td>
<td>Utilities</td>
<td>517</td>
<td>500 – 1000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>5,734</strong></td>
<td></td>
</tr>
</tbody>
</table>

*this particular company agreed to participate as a pilot with a limited number of people.

The locations where testing took place are spread out over Namibia. The map below provides an overview of all locations where the Bophelo! clinics have provided wellness testing during March until December 2009.
3.3. Demographics

Bophelo! focuses on testing at the workplace. Hence, the people tested are employed. Of these employees, 75.2% classified themselves as labour, as indicated in the table below.

<table>
<thead>
<tr>
<th>Employment Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>358</td>
<td>6.4%</td>
</tr>
<tr>
<td>Supervisor</td>
<td>423</td>
<td>7.6%</td>
</tr>
<tr>
<td>Administration</td>
<td>604</td>
<td>10.8%</td>
</tr>
<tr>
<td>Labour</td>
<td>4,194</td>
<td>75.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,579</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Of the total population tested from March to December 2009, 64.2% were men and 36.0% women, with 55.0% between the age of 25 and 39.

---

22 Only the dependents of the farm employees that were tested in the rural pilot in the end of the 2009 are unemployed. If one assumes that the total number of dependents is half of the number of people tested during the rural pilot, the number of unemployed would constitute less than 4% of the total population tested.

23 This data was only available for 5,579 clients, representing 97.3% of the population tested for wellness screening from March to December 2009.
Table 7: Age/sex distribution of people testing at Bophelo!

<table>
<thead>
<tr>
<th>Age category</th>
<th>Number of males tested</th>
<th>% of total population</th>
<th>Number of females tested</th>
<th>% of total population</th>
<th>Total age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 25</td>
<td>431</td>
<td>7.5%</td>
<td>319</td>
<td>5.6%</td>
<td>14.0%</td>
</tr>
<tr>
<td>25 – 29</td>
<td>674</td>
<td>11.8%</td>
<td>449</td>
<td>7.8%</td>
<td>20.0%</td>
</tr>
<tr>
<td>30 – 34</td>
<td>651</td>
<td>11.4%</td>
<td>446</td>
<td>7.8%</td>
<td>19.0%</td>
</tr>
<tr>
<td>35 – 39</td>
<td>574</td>
<td>10.0%</td>
<td>362</td>
<td>6.3%</td>
<td>16.0%</td>
</tr>
<tr>
<td>40 – 44</td>
<td>448</td>
<td>7.8%</td>
<td>223</td>
<td>3.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td>45 – 49</td>
<td>368</td>
<td>6.4%</td>
<td>136</td>
<td>2.4%</td>
<td>9.0%</td>
</tr>
<tr>
<td>50+</td>
<td>528</td>
<td>9.2%</td>
<td>117</td>
<td>2.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Totals</td>
<td>3674</td>
<td>64.2%</td>
<td>2052</td>
<td>36.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

3.4. Prevalence of all diseases
The Bophelo! clinics also screen for eight other diseases or risk factors. The data collected indicates that 50.6% of all people tested positive for one or more conditions while 49.4% had none of the conditions tested. 36.6% people had one condition and 14.0% had two or more conditions.

3.5. Bophelo! costing overview

*Overview of costs of running mobile clinics – HIV testing only*
The total cost of the Bophelo! programme from March until December 2009 was N$ 2.6 mln / US$ 310,337. This is the full cost of running the two mobile clinics from March until December, testing 5,124 people for HIV, and excludes the costs associated with screening for the other eight diseases/conditions. The table below shows the breakdown of the costs.

Table 8: Cost categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Total cost(N$)</th>
<th>Total cost (US$)</th>
<th>% of total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>2,103,409</td>
<td>249,543</td>
<td>80.4%</td>
</tr>
<tr>
<td>Programme management</td>
<td>248,790</td>
<td>29,516</td>
<td>9.5%</td>
</tr>
<tr>
<td>Marketing</td>
<td>248,252</td>
<td>29,452</td>
<td>9.5%</td>
</tr>
<tr>
<td>Quality control</td>
<td>16,353</td>
<td>1,940</td>
<td>0.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,616,805</td>
<td>310,451</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

If the data is broken down into more specific categories, it is evident that more than half\textsuperscript{25} of the costs of the Bophelo! operation originates in just three categories: van-related

\textsuperscript{24} Data on demographic was only available for 5,726 clients, representing 99.9% of the population tested for wellness screening from March to December 2009.

\textsuperscript{25} 55.6% of costs originate in the categories ‘van-related costs’, ‘staff cost’ and ‘S&T’.
costs, staff costs and costs associated with subsistence and travel. See also the pie chart below.

**Figure 2: Cost categories**

The categories include the following costs:

**Vehicle related costs: 19.5%**
These are costs associated with the mobile units: depreciation, fuel, maintenance costs, insurance and the salaries of the drivers.

**Staff cost: 19.2%**
Staff time of people operating the mobile clinics: the wellness testers, the counsellors and the supervisors. This category does not include time of senior or programme management, or the salaries of the drivers.

**S&T (Subsistence & Travel): 16.9%**
This includes accommodation, daily allowances and travel costs for staff.

**Test kits: 11.0%**
This cost of test kits also includes the cost of associated consumables, such as gloves and cotton wool.

**Programme management: 9.5%**
Programme management includes the cost for a full time programme manager. Furthermore, it includes bank charges, legal costs, interest received, office costs such as copying (so far as these have not been included in overhead) and dry cleaning. In addition, the personnel costs of data collection and analysis have been captured in this category.
Marketing: 9.5%
Marketing includes the costs of NABCOA’s outreach activities, the cost of producing marketing materials, such as leaflets and brochures.

Management time: 7.9%
This includes the time spent by senior management of each of the three Bophelo! partners.

Overhead: 5.9%
Overhead includes all overheads of the Bophelo! project, but does not include management time, as this is accounted for separately.

Quality control: 0.6%
Quality control includes the annual inspection and bi-annual certification of the mobile clinics and the quality assurance panels that are performed by NIP during the year.

Overview of costs per person tested
The table below shows the cost per person tested. This data only includes the cost of HIV testing and excludes the costs of the wellness tests. The average cost of screening one person for HIV in the Bophelo! mobile clinics during March–December 2009 was N$ 510.70 / US$ 60.59.

Table 9: Unit costs Bophelo!

<table>
<thead>
<tr>
<th></th>
<th>Cost (N$)</th>
<th>Cost (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per patient screened for HIV*</td>
<td>510.70</td>
<td>60.59</td>
</tr>
<tr>
<td>Total cost divided by the number of patients screened for the first time for HIV*</td>
<td>2,213.88</td>
<td>262.65</td>
</tr>
<tr>
<td>Total cost divided by the number of patients identified as HIV positive</td>
<td>4,873.01</td>
<td>578.12</td>
</tr>
<tr>
<td>Total costs divided by the number of patients newly identified as HIV positive</td>
<td>6,215.69</td>
<td>737.41</td>
</tr>
</tbody>
</table>

* excluding clients who refused HIV testing and this excludes any costs of non-HIV wellness tests

Cost variation during the year
The costs were separated into the following different time frames:

- January – October and November - December. In the last two months of 2009, Bophelo! mainly tested rural communities. Due to the high costs of travel and accommodation, the cost per person tested was expected to be higher in the later period.
- January – February and March - December. The Bophelo! operation only started in full in March after the official launch.

When considering the different time frames, the unit cost per person tested varies substantially, as illustrated in the chart below.
Figure 3: Overview of unit costs during 2009

The following table provides more detail on the cost variation during the year, and the total costs divided by the number of patients screened for the first time, the number of patients identified as HIV positive\(^{26}\) and the number of people newly identified as HIV positive.

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\(^{26}\) This includes people who are already aware of their positive status, but still want to undertake the HIV test.
Table 10: Overview of unit costs during 2009

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per patient screened for HIV*</td>
<td>61.61</td>
<td>72.37</td>
<td>125.83</td>
<td>60.59</td>
<td>63.24</td>
</tr>
<tr>
<td>Total cost divided by the number of patients screened for the first time for HIV*</td>
<td>313.72</td>
<td>165.85</td>
<td>447.61</td>
<td>262.65</td>
<td>271.73</td>
</tr>
<tr>
<td>Total cost divided by the number of patients identified as HIV positive</td>
<td>575.69</td>
<td>959.78</td>
<td>3,033.83</td>
<td>578.12</td>
<td>618.60</td>
</tr>
<tr>
<td>Total costs divided by the number of patients newly identified as HIV positive</td>
<td>748.55</td>
<td>1,219.72</td>
<td>NA</td>
<td>737.41</td>
<td>802.27</td>
</tr>
</tbody>
</table>

* excluding clients who refused HIV testing

Due to the nature of the pilot in the rural areas of Namibia during November and December, the unit cost of testing one person for HIV is higher than during the rest of the year. The increase is 14.4% compared to the average of 2009 and 19.4% when compared to the cost when the clinics were fully operational. In addition, due to the fact that the Bophelo! operation only fully started in March, the cost of testing one person for HIV during January and February 2009 (US$ 125.83) is substantially higher than the 2009 average of US$ 63.24 or the cost when the Bophelo! operation was fully operational, which was US$ 60.59.

When looking at cost per patient screened for the first time, a different outcome is clear: the cost per patient screened for the first time in November and December, when the rural pilot took place, is 38.9% lower than the annual average. Although the costs per person in this time period were higher, largely due to the longer distances travelled, a larger proportion of first-time testers was reached.

With respect to the cost per patient identified as HIV positive, there is a large variation between the short time periods (November to December and January to February) and the longer time periods (January to October and March to December). This likely occurred because of the higher costs per person tested and a lower HIV prevalence both in the rural communities and the companies tested in the first two months of 2009.

The period from March until December most accurately reflects the ongoing operations of Bophelo!: during this period full time staff was hired (not the case during January and

27 The cost of one person tested during January and February was 99.0% higher than the 2009 average.
February). To provide a representative reflection of the cost of Bophelo! in an ongoing situation, the remainder of this report will consider the costs from March until December.

**Opportunities for cost savings**

As 2009 was the first year of operation, it is likely that the clinics could be used more efficiently in future years. Per day, the two Bophelo! clinics could test 64 people maximum. If one would assume that the mobile clinics would be operational for 50 weeks a year, and 15.0% lag/travel time, then 13,600 people could be tested. In that case, the per patient cost could be lowered to N$ 306.52 / US $ 36.36 if a whole year is considered. This difference is caused by the fact that fixed costs, including staff costs, are paid even if the van is not in use. If the lag/travel time is higher, for example 25.0%, then the costs could be lowered to N$ 328.00 / US $ 38.91 per person tested for HIV.

**Cost for full wellness testing**

Although this research focuses on the costs of HIV testing, the Bophelo! clinics found that 50.6% of those tested had at least one condition of concern. We can look at this cost in two ways. We can divide the total cost of the Bophelo! program by the full number of people tested, including those who elected NOT to have the HIV test. This adds an additional 510 persons tested. Or we can estimate the labor and materials required to conduct the additional tests once a patient is receiving the HIV test and counselling.

The following table applies the first approach and shows the cost per person tested for wellness screening for all who participated in the screening program from March to December 2009. It also shows the cost per condition identified for the period. This calculation includes the costs of the wellness screening tests, which were excluded from the previous tables. The cost of providing full wellness testing is N$ 552.03 / US$ 65.49 per person tested, based on all people that took part in the wellness testing (5,734). The increase in costs per person screened is only US$4.23, with the larger number of people testing partially offsetting the cost of testing for the additional diseases.

**Table 11: Cost of providing wellness tests**

<table>
<thead>
<tr>
<th>Cost (N$)</th>
<th>Cost (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full operating cost of a mobile, multi disease screening program in Namibia</td>
<td>3,165,357</td>
</tr>
<tr>
<td>Cost per patient screened*</td>
<td>552.03</td>
</tr>
<tr>
<td>Cost per patient screened without HIV test **</td>
<td>587.70</td>
</tr>
<tr>
<td>Cost per condition identified</td>
<td>729.01</td>
</tr>
<tr>
<td>Cost per person identified with one or more condition</td>
<td>1,049.22</td>
</tr>
<tr>
<td>Percentage of people identified with one or more condition</td>
<td>50.6%</td>
</tr>
</tbody>
</table>

*Including clients that refused HIV testing, but did undertake wellness testing  
**excluding clients that refused HIV testing

28 Each van has two consulting rooms; 16 people maximum can be tested per consulting room per day.  
29 Assumption that around Christmas and New Year the mobile clinics would not run for two weeks.  
30 Calculated using proportionally increased van related costs (petrol and maintenance), additional costs of test kits, S&T (based on Nov/Dec 2009), accommodation (based on Nov/Dec 2009) and includes staff for one full year.
Looking at adding the screening costs for the other diseases to the HIV counselling/test, we get the incremental cost, which is higher than this cost difference.

- cost of the wellness test kits for other diseases:
  - N$ 72.69 / US$ 8.62 per person tested
  - extra staff time (15%): N$ 131,725 / US$ 15,627
  - N$ 22.97 / US$ 2.73 per person tested

Bophelo! staff estimated that the full battery of tests for a person taking the HIV test rarely took more than 15% longer than the HIV test alone, and might have been less. The HIV test takes time to develop, during which other tests are conducted. Post HIV test counselling cannot begin until the HIV test results are known. So testing for other diseases is an efficient use of the time that patients wait for their HIV test result.

The total incremental costs of providing wellness testing is N$ 95.67 / US$ 11.35. Compared to the average unit cost of testing one person for HIV only, this is an increase of 18.7%, to screen for all the additional diseases

### 3.6. Sensitivity analysis

The following assumptions were tested:

**Useful life of the mobile clinics**

The current assumption is that the useful life of the mobile clinics is 5 years, with nil salvage value. If this would be shortened to 3 years, the overall costs would increase by 2.4%, leading to an average per person tested price of N$ 522.86 / US$ 62.03.

**Number of people tested**

To provide for comparisons across different VCT modes, the per person unit cost has been calculated. Naturally, the unit cost is highly dependent on the number of people actually tested. In this case, the number of people tested is considered to be reliable, as patient data has been collected in all cases. However, if one would consider 20% less people or 20% more people tested during March until December 2009, the per person unit costs would change respectively from + 17.5% to -11.6%.

---

31 Including a provision for 10% wastage
32 Based on all people that participated in wellness screening during March – December 2009, which is 5,734.
Table 12: Overview of unit costs with increase/decrease in number of people tested

<table>
<thead>
<tr>
<th>Difference in number of people tested</th>
<th>Total number of people tested</th>
<th>Per person cost N$</th>
<th>Per person cost US$</th>
<th>% change per unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>20% less people tested</td>
<td>-1,025</td>
<td>4,099</td>
<td>599.88</td>
<td>71.17</td>
</tr>
<tr>
<td>10% less people tested</td>
<td>-512</td>
<td>4,612</td>
<td>550.33</td>
<td>65.29</td>
</tr>
<tr>
<td>actual number tested</td>
<td>0</td>
<td>5,124</td>
<td>510.70</td>
<td>60.59</td>
</tr>
<tr>
<td>10% more people tested</td>
<td>512</td>
<td>5,636</td>
<td>478.27</td>
<td>56.74</td>
</tr>
<tr>
<td>20% more people tested</td>
<td>1,025</td>
<td>6,149</td>
<td>451.24</td>
<td>53.53</td>
</tr>
</tbody>
</table>

This table includes the extra costs of test kits per person tested and proportional extra or less fuel and S&T costs. It does not include extra staff cost, as there is assumed to be spare capacity to provide the extra wellness tests. The results show that the per person costs decrease with an increase in scale, indicating an increased efficiency in line with the findings of the PANCEA project that researched the association between scale and efficiency for five countries (Marseille, 2007).

Lower price of test kits
Bophelo! did not procure test kits in bulk, and therefore pays a relatively high price of US$ 5.55 per test kit. If a lower price is used, for example that for New Start, the cost per person would decline to N$ 490.18 / US$ 58.15.

3.7. Sources of funding
Funding for Bophelo! for the period of March until December 2009 originates from the following sources:

- Domestic private sector: from March until December 2009 ten Namibian organisations requested the services of Bophelo!. Although the invoice approach differed per company, in general the companies were invoiced for separate categories of cost, such as the staff time, mobile unit costs (such as insurance and maintenance), accommodation, and kilometre charges. The invoice would outline each item and would clarify which items would be covered by subsidy from NABCOA (Global Fund). The company would pay the remaining items. The total amount that the private sector contributed during this time period to the HIV testing part of the Bophelo! programme is N$ 986,138 / US$ 116,993, over a third of all the costs of Bophelo!. This excludes any payments specifically made with regards to wellness testing (for non-HIV diseases and risk factors), which was N$ 33,924 / US$ 4,025.

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33 IntraHealth buys its test kits on average for US$ 3.33 (excluding any calculation for wastage)
34 Including 10% allowance for wastage
35 If payments for wellness testing are included, the overall private contribution is N$ 1,020,062 / US$ 121,018, 30% of all total costs for providing full wellness testing.
- **Domestic public sector:** the Namibia Institute of Pathology provides free quality control and free secure parking. The total value of NIP’s contribution for March until December 2009 is estimated at N$ 29,300 / US$ 3,476.

- **International donors:**
  - For the period March until December 2009 the Global Fund through NABCOA has provided N$ 1,049,100 / US$ 124,463 as direct funding for salaries, test kits and KAPB surveys.
  - The Global Fund provided the majority of the funding of NABCOA’s role in outreach and marketing, a total value of N$ 418,313 / US$ 49,628\(^{36}\)
  - A range of other international donors has provided NABCOA’s management fee of N$ 120,000 / US$ 14,237.
  - The Dutch NGO HIVOS provided funding for testing of farmers of N$ 11,850.00 / US$ 1,405.86.
  - The PharmAccess Foundation has contributed N$ 2,103 / US$ 250 through their role as programme manager of Bophelo!

Overall, the graph below shows that the main funder of the costs of Bophelo! is the Global Fund, followed by the private sector contributions of 38% of the total costs. Looking at a local perspective, 39% was sourced from within Namibia.

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\(^{36}\) The costs of depreciation are also included as a Global Fund contribution: even though currently no depreciation is charged, Global Fund initially paid for NABCOA’s van.
4. Fixed site screening in Namibia

4.1. Introduction
IntraHealth runs the 18 New Start Centres in Namibia. This chapter provides an overview of the cost data on these 18 centres.

4.2. Prevalence
70,143 people were tested in the 18 New Start Centres in Namibia in 2009. 16.0% of all people tested at New Start Centres in 2009 were tested during the National Testing Week. The overall prevalence among the population tested in 2009 is 10.5%, very similar to that observed by Bophelo! The prevalence per centre differs widely from 4.8% to 19.6%.

Of all people tested, 11.8% were so-called “re-testers”, people that had tested within the prior 12 months, either at New Start, or at other testing centres. The actual number of individuals that were reached through the New Start Centres during the year is 61,895\textsuperscript{37}.

4.3. Demographics
New Start data shows that 57.1% of all people tested are women, and 42.9% are men.

\textsuperscript{37} This counts people that might have tested twice as one person.
4.4 New Start costing overview

Overview of costs of running 18 fixed site VCT centres

Overall, the New Start Centres have reported costs of just over N$ 34 million, or about US$ 4 million.

Table 13: Cost categories New Start Centres

<table>
<thead>
<tr>
<th>Category</th>
<th>N$</th>
<th>US$</th>
<th>% of total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>30,553,830.</td>
<td>3,624,832</td>
<td>88.8%</td>
</tr>
<tr>
<td>Programme management</td>
<td>1,920,000</td>
<td>227,784</td>
<td>5.6%</td>
</tr>
<tr>
<td>Marketing</td>
<td>1,558,655</td>
<td>184,915</td>
<td>4.5%</td>
</tr>
<tr>
<td>Quality control</td>
<td>382,725</td>
<td>45,406</td>
<td>1.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34,415,209</strong></td>
<td><strong>4,082,936</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

If the data is broken down into more specific categories, it becomes clear that the main cost category is staff costs, followed by overheads and other operational costs. See also the pie chart below.

Figure 5: Detailed cost categories New Start Centres

Staff cost 35.8%

Staff costs include the costs of all staff at the New Start Centre, as provided by IntraHealth. This excludes any staff that contribute to the New Start Centres that might be paid by other organisations.38

38 In discussion with IntraHealth a 5% addition was included in the overall operating costs to allow for contributions made by other organisations.
**Overhead 18.0%**
Overhead is 30.89% of direct costs, the approved indirect cost rated charged to USAID under the IntraHealth contract.

**Other operating costs 17.9%**
Other operating costs include rent, utilities, maintenance of cars and buildings, fuel and other operational costs that might occur. This data also includes an estimate of 5% to cover the contributions of other organisations to the New Start Centres that are not included in the USAID contract payments. Unfortunately it was not possible to separate this data further.

**Building related costs and depreciation 9.2%**
This category consists of the depreciation on four buildings owned by New Start’s partners plus depreciation on IT equipment and furniture.

**Test kits 6.3%**
The costs for test kits also include the costs for consumables, such as needles, wool, etc.

**Programme management/management time 5.6%**
This category represents the cost of management time devoted to the New Start program by managers and staff at the central IntraHealth office in Windhoek.

**Marketing 4.5%**
Marketing costs include the allocation of salaries of Nawa Life employees, the costs of publication materials and other media channels, such as radio and TV.

**Travel 1.6%**
This includes the cost for travel as reported by IntraHealth.

**Quality control 1.1%**
Quality control includes the annual inspection and bi-annual certification of the clinics and the quality assurance panels that are performed by NIP during the year. It also includes petrol, S&T and accommodation for NIP staff performing quality control.

**Overview of costs per person tested**
The following table provides an overview of the costs per person screened for HIV. Because New Start did not collect data on those testing for the first time, or testing positive for the first time, costs in these categories cannot be calculated. The average across all New Start Centres in 2009 is N$ 490.72 / US$ 58.22.
Table 14: Unit costs New Start Centres

<table>
<thead>
<tr>
<th></th>
<th>N$</th>
<th>US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs</td>
<td>34,415,209</td>
<td>4,082,936.33</td>
</tr>
<tr>
<td>Cost per patient screened for HIV</td>
<td>490.64</td>
<td>58.21</td>
</tr>
<tr>
<td>Total cost divided by the number of patients screened for the first time for HIV*</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total cost divided by the number of patients identified as HIV positive</td>
<td>4,695.76</td>
<td>557.09</td>
</tr>
<tr>
<td>Total costs divided by the number of patients newly identified as HIV positive</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cost per person reached by New Start</td>
<td>556.03</td>
<td>65.97</td>
</tr>
</tbody>
</table>

4.5 Sensitivity analysis

The following assumptions were tested:

Contribution by donors

The assumption taken in the study is that the contribution from third party donors that provide resources to New Start without charge is 5.0%. However, if that would be changed to 10.0%, the total costs per person for New Start Centre would be N$ 503.18 / US$ 59.70 per person, an increase of 2.6%. Similarly, if the contribution from third parties is estimated to be 20.0%, the costs per person would increase to N$ 528.26 / US$ 62.67, an increase of 7.7%.

Number of people tested

As with the Bophelo! mobile clinics, the unit costs per person actually tested have been calculated for the New Start Centres. Since most costs are fixed, the unit cost is highly dependent on the number of people actually tested. A sensitivity analysis was performed, increasing and decreasing the number of people tested by 10% and 20%. The results are shown in the Table below.

Table 15: Overview of unit costs with increase/decrease in number of people tested

<table>
<thead>
<tr>
<th></th>
<th>Difference in number of people tested</th>
<th>Total number of people tested</th>
<th>Per person cost N$</th>
<th>Per person cost US$</th>
<th>% change per unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>20% less people tested</td>
<td>-14,029</td>
<td>56,114</td>
<td>593.56</td>
<td>70.42</td>
<td>21.0%</td>
</tr>
<tr>
<td>10% less people tested</td>
<td>-7,014</td>
<td>63,129</td>
<td>536.39</td>
<td>63.64</td>
<td>9.3%</td>
</tr>
<tr>
<td>actual number tested</td>
<td>0</td>
<td>70,143</td>
<td>490.64</td>
<td>58.21</td>
<td>0.0%</td>
</tr>
<tr>
<td>10% more people tested</td>
<td>7,014</td>
<td>77,157</td>
<td>453.22</td>
<td>53.77</td>
<td>-7.6%</td>
</tr>
<tr>
<td>20% more people tested</td>
<td>14,029</td>
<td>84,172</td>
<td>422.03</td>
<td>50.07</td>
<td>-14.0%</td>
</tr>
</tbody>
</table>
The calculation includes the increased or decreased costs of the test kits, and a pro rata inclusion or exclusion of the category ‘other operational costs’, depending on the increased or decreased number of people tested. The staff and facility costs have been kept stable, as it is assumed that there is capacity available to accommodate these changes in volume. As we saw with the Bophelo! clinics, the unit costs decrease with an increase in scale.

4.6 Sources of funding
The funding for the New Start Centres originates fully from the international and national public sector:

- **International donor:** PEPFAR through USAID provides funding for the marketing activities (through USAID’s partner Nawa Life) and the test kits (through USAID’s partner SCMS). In addition, PEPFAR provides all funding to IntraHealth to cover the running costs and overheads associated with the New Start Centres. The estimated value of the contribution in 2009, including direct payments to SCMS and NAWA life is N$ 30,373,403 / US$ 3,603,426.

- **Domestic donor:** a number of the New Start Centres receive funding from faith-based or community organisations. Unfortunately the extent of the funding is not available, but an estimate was provided by New Start of 5.0% of the operational costs, which is estimated at N$ 879,600 / US$ 104,354. In addition, the costs of depreciation of the offices are borne by the owners of the integrated centres, which is estimated at an additional N$3,162,205 / US$ 375,156. In total the contribution of the external donors is estimated at N$ 4,041,806 / US$ 479,510.
5. Comparison of fixed site and mobile screening

5.1. Introduction
This chapter compares the two different modes of operations: mobile HIV screening and fixed site screening. Caution should be taken when drawing conclusions on the basis of this information, as this research focuses on costs, and has not attempted to monetise the benefits of each approach. In addition, the only option to compare the costs between the two models is to compare on a per person tested basis. However, the unit cost is sensitive to the number of people tested, a variable that could change throughout the year for both modes of operation.

5.2. Comparison of unit costs
The table below shows the per unit cost of both operations, based on the numbers of people tested.

<table>
<thead>
<tr>
<th>Table 16: Comparison of unit costs</th>
<th>Bophelo! (US$)</th>
<th>New Start (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per patient screened for HIV*</td>
<td>60.59</td>
<td>58.21</td>
</tr>
<tr>
<td>Total cost divided by the number of patients screened for the first time for HIV*</td>
<td>262.65</td>
<td>NA**</td>
</tr>
<tr>
<td>Total cost divided by the number of patients identified as HIV positive</td>
<td>578.12</td>
<td>557.09</td>
</tr>
<tr>
<td>Total costs divided by the number of patients newly identified as HIV positive</td>
<td>737.41</td>
<td>NA**</td>
</tr>
</tbody>
</table>

* excluding clients who refused HIV testing at Bophelo! clinics. This also excludes any costs of non-HIV wellness tests
** cannot be calculated because New Start did not have data on first time testers

This overview shows that the New Start average 2009 unit cost is 3.9% lower than the Bophelo! average cost during March until December 2009. This difference is equal to the higher price that the Bophelo! organisation pays for the test kits in comparison to IntraHealth⁴⁹.

Both the Bophelo! and New Start costs exclude any costs incurred by the person being tested. These are essentially zero in the Bophelo! model, as the employee is given time off from work for testing by his employer, and the test clinic is immediately available at the work site. There may be some cost to the employer, who continues to pay wages during the brief time required for the test, but no cost to the worker. A patient who seeks testing at a New Start clinic must travel to the clinic site. In a sparsely populated country like Namibia, such costs can be high, and include taxi fare or petrol, as well as possible time lost from work. In effect, Bophelo! internalizes the transport costs which must be incurred by the patient in the New Start model.

⁴⁹ The difference in the unit cost is US$ 2.35. Bophelo! pays per person tested US$ 2.43 more for a test kit (incl.10% wastage).
5.3. Comparison of cost categories

Table 17: Comparison of cost categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Bophelo!</th>
<th>New Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total employment cost, consisting of:</td>
<td>37.3%</td>
<td>41.4%</td>
</tr>
<tr>
<td>Programme mgt / management time*</td>
<td>18.9%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Staff cost</td>
<td>18.4%</td>
<td>35.8%</td>
</tr>
<tr>
<td>Vehicle related costs (depreciation, fuel,</td>
<td>19.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>maintenance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S&amp;T (travel)</td>
<td>15.6%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Test kits</td>
<td>10.5%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Marketing</td>
<td>9.8%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Overhead</td>
<td>6.5%</td>
<td>18.0%</td>
</tr>
<tr>
<td>Quality control</td>
<td>0.6%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Other operating costs</td>
<td>0.0%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Building related costs (depreciation)**</td>
<td>0.0%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

*This category combines the Bophelo! cost categories of ‘Programme management’ and ‘Management time’
** This category includes rent, maintenance of buildings, and other operational costs. Unfortunately it was not possible to obtain further detailed information on this cost category.

There are some striking differences and similarities between the cost categories for the two organisations:

- Total employment cost: for both organisations the employment costs are around 40% of total costs. This is lower than the average % of employment costs reported in other studies (see section 2.2).
- Travel related costs: Unsurprisingly, the costs for vehicles (19.7%) and staff travel---including accommodation and overtime (15.6%) are a high percentage of Bophelo!’s overall costs.
- Overhead: IntraHealth’s overhead is 18.0%, nearly three times as high as the Bophelo! overhead rate of 6.5%. Both organisations have reported that this rate excluded any costs for management, which is already included in the employment costs outlined above. It is possible that the capture of overhead costs is more complete for New Start because of the rigorous USAID accounting rules.
- Other operating costs: IntraHealth has reported a high percentage of costs in the ‘Other operating costs’ category. Unfortunately it was not possible to separate this category further and it has therefore not been possible to further analyse this category.
- Test kits: as indicated before, IntraHealth was able to procure the test kits at a reduced price due to the larger scale of its operation and its relationship with the USAID-sponsored Supply Chain Management System. This is also evidenced in the higher share of the cost of test kits in the Bophelo! operation. Due to the relatively small size of the operation, Bophelo! has not been able to buy in bulk and has thus not been able to access the same prices as IntraHealth. As a consequence, USAID
pays N$ 28.09 / US$ 3.33 per test kit, whereas PharmAccess pays N$ 46.75 / US$ 5.55 per test kit\(^{40}\), a difference of 40.0%.

- Marketing: Bophelo!’s marketing costs are more than double the share of New Start’s marketing costs. This could be attributed to the fact that NABCOA employs one full-time marketing person, which constitutes nearly 70% of all marketing costs.

- Quality control: New Start’s costs for quality control (as a proportion of total costs) are double relative to Bophelo!’s. This is purely due to the fact that the medical technicians must travel out to the New Start sites, which increases the costs of S&T with regards to quality control. Because the Bophelo! vans are based in Windhoek, they are readily available to NIP inspectors without any travel costs.

5.4. Contribution of public and private sector

The New Start clinics are solely funded by international and national donors, whereas the Bophelo! operation is one-third funded by private, local companies. The following table provides an overview of the costs funded by public (including domestic and international donors) and private funding.

Table 18: Public and private contribution

<table>
<thead>
<tr>
<th></th>
<th>Public (US$)</th>
<th>Private (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bophelo!</td>
<td>193,458</td>
<td>116,993</td>
</tr>
<tr>
<td>Bophelo! %</td>
<td>62.3%</td>
<td>37.7%</td>
</tr>
<tr>
<td>New Start</td>
<td>4,082,936</td>
<td>0.00</td>
</tr>
<tr>
<td>New Start %</td>
<td>100.00%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

The unit costs to the public sector for testing one person in the Bophelo! clinic are 35% lower than the cost to the public sector of testing one person in the New Start Centres. This is also illustrated in the table below.

Table 19: Unit costs to the public sector

<table>
<thead>
<tr>
<th></th>
<th>Bophelo! (US$)</th>
<th>New Start (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full unit cost</td>
<td>60.59</td>
<td>58.21</td>
</tr>
<tr>
<td>Private sector unit cost</td>
<td>22.83</td>
<td>0.00</td>
</tr>
<tr>
<td>Net public sector / donor unit cost</td>
<td>37.76</td>
<td>58.21</td>
</tr>
</tbody>
</table>

5.5. Rate of follow up

Unfortunately, for both organisations there is no information available on the number of patients actually pursuing follow up treatment or HIV. However, IntraHealth data confirms that 11.8% of their testers re-visit the clinic for follow-up tests.

\(^{40}\) Excluding any costs for wastage.
5.6. Target groups / groups reached

Bophelo!’s main target group are employees of national firms. This is reflected in the demographic data: 55.0% are between the age groups of 25 and 39.

Of the total population tested in the Bophelo! clinics, 64.2% are male. In comparison, 42.9% of the people tested at the New Start centres are male and 57.1% are female. Employment at the sites visited by Bophelo! is skewed towards males, but the results suggest that mobile multi-disease screening clinics may be an effective way to reach males reluctant to access New Start centres or unwilling to believe they are at risk of HIV infection.

Data on Bophelo! shows that during the rural pilot in Nov-Dec, the clinics reached a large proportion of people that had never tested before. This is a clear advantage of using mobile services: the mobile clinics are able to access areas where no VCT services are available.

Although only a limited comparison can be made with New Start Centres due to a lack of data on demographics, the above information suggests that mobile clinics have the opportunity to attract hard to reach target groups, such as dispersed rural populations. In addition, by bringing the test clinic to the work site, and screening for multiple diseases and conditions, Bophelo! makes it easier for those who are reluctant to be seen testing at a facility that provides only HIV testing.

5.7. Conclusions

- **What is the full cost of operating a mobile, multi disease screening program in Namibia?**
  - The table below provides the cost for HIV screening and for full wellness screening, and the cost of New Start Centres:

  Table 20: Comparison of unit costs of Bophelo! HIV screening, Bophelo! full wellness screening and New Start Centre

<table>
<thead>
<tr>
<th></th>
<th>Bophelo! Only HIV screening (US$)</th>
<th>Bophelo! Full wellness screening (US$)</th>
<th>New Start (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full operating cost</td>
<td>310,451</td>
<td>375,530</td>
<td>4,082,936</td>
</tr>
<tr>
<td>Cost per patient screened*</td>
<td>65.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost per patient screened **</td>
<td>60.59</td>
<td>69.72</td>
<td>58.21</td>
</tr>
<tr>
<td>Costs divided by the number of conditions identified</td>
<td></td>
<td>86.49</td>
<td></td>
</tr>
<tr>
<td>Cost divided by the number of persons identified with one or more condition</td>
<td></td>
<td>129.49</td>
<td></td>
</tr>
<tr>
<td>Total cost divided by the number of patients identified as HIV positive</td>
<td>578.12</td>
<td></td>
<td>557.09</td>
</tr>
</tbody>
</table>

*including clients that refused HIV testing, but did undertake wellness testing
**excluding clients that refused HIV testing
• **What is the value of the private (employer fee) and public (donors and Namibian Government) contributions to the cost of the Bophelo! program?**
  o The private sector provides 37.7% of the costs (N$ 986,138 / US$ 116,993).
  o The public sector, including foreign donors provides 62.3% of the costs (N$ 1,630,666 / US$ 193,458).

• **Is mobile screening more or less efficient than fixed site screening for HIV infection?**
  o Per person tested, mobile screening is 4.0% more expensive than fixed site testing. This difference is approximately equal to the higher prices paid for HIV test kits.
  o However, the stated per patient cost does not include the patient’s cost of travel to get to a clinic, which in the case of Bophelo! is zero.
  o In terms of leveraging private resources, Bophelo! is more efficient: IntraHealth does not use private resources, whereas the Bophelo! operation is one third funded by local Namibian companies. The net cost to the public sector per patient screened at Bophelo! is currently lower than at New Start because of these employer payments.

• **Is Bophelo! more effective at reaching out to groups that are unlikely to seek VCT?**
  o As there is only limited data available on the demographics of the people reached through the New Start Centres, it is difficult to make this comparison.
  o However, the data does show that Bophelo! has been effective at reaching out to groups that are unlikely to seek VCT, such as rural employees with limited access to VCT services. Screening at work sites also reaches a larger proportion of males than are screened at fixed site VCT centers.
6. Discussion

6.1. Introduction
This research has provided interesting findings and a unique comparison between fixed site VCT and mobile VCT. This chapter will highlight some further thoughts and possible implications of the findings.

6.2. Discussion

Private sector contributions
Local Namibian companies have provided 37.7% of all costs of the Bophelo! operation, dropping the public sector cost per patient screened below that for fixed site VCT (New Start). In Namibia, employers have been willing to pay over 1/3 of the cost of a screening program delivered to the work site.

It would now be interesting to follow the Bophelo! project over the next few years to see if local companies continue to be willing to pay for screening for their employees on a regular basis.

Cost to the public sector
When the contribution by private sector employers is deducted from total cost, and only the actual cost to the public sector is considered, providing VCT through the Bophelo! programme has a lower cost to the public purse than fixed site VCT.

Target groups
Mobile clinics have the option to travel to areas where no VCT services are available. In addition, the Bophelo! clinics are flexible in their operational hours and are willing to open after normal clinic hours. Also, the Bophelo! clinic presence at the work site and arrangements with employers ensures that employees can test during working hours at no cost to the employee. Testing at work sites reaches proportionately more males, and the multi-disease aspect of Bophelo! testing enables it to attract workers who may not think they are at risk of HIV infection or who fear “self-identifying” by seeking out testing services at a site that only screens for HIV.

Should New Start run mobile clinics?
This research shows that the additional costs of mobile clinics are relatively low compared to the fixed site costs of IntraHealth, and that difficult to reach target groups can be accessed. New Start might want to operate mobile clinics as well, but should also charge employers in order to minimize public sector costs, as Bophelo! has done.

Implementation in other countries
There is no reason why the mobile multi-disease screening approach should not work in other countries. Although one of the original reasons to start Bophelo! in Namibia was the
low population density, most people tested were actually based at formal sector workplaces in cities where New Start Centres are available.

**Further use for the mobile clinics – rural areas**
The research has shown that in rural areas people, a particularly large portion of the patients have never tested before. To reach these target groups, use of mobile VCT clinics should be expanded. The difficulty will obviously be that there are fewer employers (or employers with fewer employees), reducing the available employer payments. Mobile testing programs in rural areas will generally require a higher average level of public subsidy than shown here.

**Outsourcing**
Although Bophelo!’s mobility imposes some higher costs, the unit cost per patient tested for HIV is only slightly higher that at New Start. And the full screening program for other diseases is included at a modest additional cost. The private management of Bophelo! facilitates preventive maintenance and flexible staffing that would be difficult for MOHSS. Government of Namibia contracting with Bophelo! or a similar mobile multi-disease testing organization could be an economical and effective public private partnership.

**Wellness testing vs just HIV testing**
The incremental cost of providing wellness testing at Bophelo! is only N$ 95.67 / US$ US 11.35. Bophelo! screens for 9 diseases or conditions, and 50.6% of those screened show evidence of at least one risk factor or disease. Yet only 10% of those screened were infected with HIV. There is increasing recognition of the burden of other chronic diseases. Bophelo! is an efficient way to get these Namibians into monitoring and treatment in a timely fashion.

**Funding**
The Bophelo! programme is still dependent on donor funding, although employer payments reduce the required public/donor subsidy below that currently required for New Start. In the long run, Bophelo! like programs will require continued public subsidy, but this is a sound investment so long as the subsidy per person tested is below the unit cost of publicly funded fixed-site facilities.

**6.3. Conclusion**
For a small increment in total cost (compared to fixed site HIV VCT testing), Bophelo! brought multi disease screening to work sites and isolated rural populations. After taking into account the fees paid by employers, the cost to donors and the public sector for each person tested was lower than in fixed site HIV testing fully supported by Government/donor funds. Mobile multi disease testing clinics should be expanded in Namibia and employers should continue to pay a portion of the cost. Contracting for mobile screening services, which require financial and operational flexibility, could be an important public private partnership advancing Namibia’s health objectives.
Appendices

I  Memorandum of Understanding
II Approval from Boston Medical Centre – Institutional Review Board
III Approval from Ministry of Health and Social Services, Namibia
IV Literature
V Model and User Guide
Appendix One

Bophelo! - Memorandum of Understanding

Memorandum of Understanding
Bophelo Partnership

Objective
To improve access to high quality testing and counseling for the early identification of health risks of Namibian workers and their dependents through a public/private partnership formed by the parties to this agreement and supported in part by payments by Namibian employers. Testing and counseling will be accomplished by bringing a mobile “Bophelo” testing van to work sites throughout Namibia, where high quality testing and counseling will be offered. Testing will include screening for HIV, diabetes, cholesterol, anthropometrics (weight, height, waist circumference, BMI), blood pressure, syphilis, Haemoglobin, and Hepatitis B. Risk assessment questions for TB risk identification are included in the screening, although no TB rapid test is available for use. The tests provided through this service may be changed from time to time as agreed by the parties and the Ministry of Health. Any such changes in protocol will be documented in writing.

Parties
Namibian Business Coalition on AIDS (NABCOA)
This is a non-profit organization providing a variety of HIV/AIDS services. NABCOA mobilizes the Namibian private sector firms to combat the HIV/AIDS pandemic.

Pharmaccess Foundation (Namibia)
A Namibian non-profit organization affiliated with the Pharmaccess Foundation of the Netherlands. Pharmaccess supports a variety of programs to address the AIDS pandemic, with an emphasis on involving the private sector in the provision of prevention, care and treatment for HIV/AIDS through health insurance or medical aid funding.

Namibia Institute of Pathology (NIP)
A Namibian parastatal organization providing laboratory services and national quality assurance testing for Namibian health care providers.
Overview of the Partnership

The strategy of the Ministry of Health and Social Services (MoHSS or, "the Ministry") is in the process of expanding the availability of counseling and testing/screening for diseases that create a significant burden in Namibia, including HIV/AIDS. To this end, the Ministry is supporting provider initiated HIV testing as well as free standing sites for Voluntary Counseling and Testing (such as New Start). The Ministry has recently begun to license mobile testing facilities capable of providing counseling and testing at workplaces and other sites.

PharmAccess and NABCOA have each purchased and outfitted a mobile testing van with two testing/counseling rooms and ancillary facilities. Both are referred to in this agreement as the Bophelo vans. The Ministry has trained counselors in the HIV rapid testing and counseling protocols according to national guidelines, and PharmAccess Foundation has trained these staff in the measuring of anthropometrics and blood pressure and the use of rapid tests for diabetes, cholesterol, haemoglobin, Hepatitis B and Syphilis. The Ministry has inspected and licenced the Bophelo vans as mobile clinics for this purpose.

The vans will travel to work sites at the invitation of employers, who will pay a share of the costs of operation. Voluntary testing on the van will be available to all employees, and—at the discretion of the employer—may be available to others (such as dependents and contractors) with access to the premises where the Bophelo van is located. Individuals will be counseled and tested with approved rapid tests, and informed of the test results during the counseling session. An individual testing positive for any of the listed diseases will be referred to a Government clinic, or employer supported health provider, for appropriate follow-up and treatment.

The NIP will provide quality control testing for the services that are conducted in the Bophelo vans.

Contributions of the Parties to the Partnership

NABCOA

1. The use of its Bophelo van - properly licensed, maintained and equipped.
2. Funds for the purposes of supporting mobile testing.
3. Outreach services to employers to raise awareness of the availability of the Bophelo vans and for enrollment as NABCOA members.
4. Costs of maintenance for the Bophelo van owned by NABCOA.
5. Follow-up services to employers to ensure that comprehensive workplace support is provided to employees/beneficiaries before and after testing.
6. Advance promotion of the visit of a Bophelo van, including public information materials, to maximize the number of patients screened during the visit.
Pharmaccess

1. The use of its Bophelo van, properly licensed, maintained and equipped.
2. Training to ensure that qualified and trained wellness counselors and site supervisors are available for both Bophelo vans.
3. Logistic support and management of the on-site testing process, including scheduling of the field visits of both Bophelo vans.
4. Purchase and provision of all required stock, including rapid test kits.
5. Maintenance program for both Bophelo vans
6. Accommodation and logistic arrangements for the Bophelo team at testing sites.
7. Billing and collection of fees for testing services according to fee schedules determined by Pharmaccess.
8. Computer entry of data collected
9. Analysis of data collected during the testing process and of data on referral follow up
10. Statistical reports to employers, NABCOA, NIP and MoHSS

Namibian Institute of Pathology

1. Quality control services for tests performed on the Bophelo van.
2. Regular unscheduled site visits to monitor quality during testing
3. Regular proficiency tests on test kits utilized
4. Retesting of every 20th rapid test sample using whole blood for QA of HIV testing
5. Report the results of items 1-4 to the Bophelo partners.

Obligations of the Parties

NABCOA

1. Shall transfer to Pharmaccess, in agreed increments, all funds received and budgeted for the operation of the Bophelo vans.
2. Shall provide its van, at no cost, to be operated by PharmAccess for the provision of on-site testing services. NABCOA shall pay licensing, vehicle insurance and maintenance costs for this van.
3. Shall provide support to the employers for the development and implementation of workplace programs and workplace/community support structures to encourage testing uptake and treatment support.
4. Shall extend membership to any employer seeking Bophelo services that:
   a. meets the general standards for NABCOA membership
   b. demonstrates a commitment to develop and maintain an employer policy for HIV prevention and control
   c. pays the standard NABCOA membership dues for a firm of its size and type
5. Shall follow up with employers to encourage completion of Bophelo referrals and to obtain data indicating the uptake of referrals after Bophelo testing.

Pharmaccess

1. Shall maintain and operate both Bophelo vans in good mechanical condition and in conformance with the conditions of the clinic licenses issued by the Ministry.

2. Shall establish and periodically revise a schedule of charges to be made to employers for the services of Bophelo vans. There shall be one schedule of charges (Schedule A) for services to employers who are members of NABCOA, or that belong to an umbrella organization that is a member of NABCOA. The charges in Schedule A shall reflect the availability of Global Fund or other grants to support services provided by Bophelo to NABCOA members. Pharmaccess shall develop a second and higher set of charges (Schedule B), reflecting the lack of any subsidy provided through NABCOA. Firms that do not belong to NABCOA or to an umbrella organization that belongs to NABCOA shall be charged according to Schedule B. Any firm receiving Bophelo services must demonstrate a commitment to maintaining a workplace program to combat HIV/AIDS.

3. Shall, in its sole discretion, determine the prices to be paid by a firm or employer for Bophelo services under Schedules A and B. Such prices shall be transparent and the price list (Schedules A and B) shall be provided to any firm considering Bophelo services.

4. Shall develop a standard form of agreement to be signed with any employer wishing to obtain Bophelo services.

5. Shall give precedence to employers that are members of NABCOA, or of umbrella organizations belonging to NABCOA, in the scheduling of Bophelo services.

6. Shall pay all costs associated with the operation of the Bophelo vans, including remuneration of counselors and supervisors and purchase of fuel, test kits, traveling allowances and accommodation from funds received from the Global Fund via NABCOA, or other donors (if any) and company contributions.

7. Shall collect and retain all fees charged to firms and employers under the standard form of agreement.

8. Shall provide high quality supervision of all wellness counselors.

9. Shall schedule the visits of both Bophelo vans and make all necessary personnel and logistic arrangements for both vans.

10. Shall provide high quality pre- and post-test counseling for each client.

11. Shall provide proper referrals to clients who require follow-up as a result of Bophelo screening. For clients with adequate insurance coverage, such clients shall be referred to the nearest qualified private provider. All others shall be referred to the nearest Government sponsored clinic competent to treat the disease diagnosed. Each patient shall be provided with a Ministry-approved referral letter indicating the date and information identifying the need for referral.
12. Shall provide to the Ministry and to the other partners data on the number and characteristics of clients tested and on the aggregate outcome of the tests.

13. Shall provide to the other partners and outside evaluators, in a simple and mutually agreed form, data on the cost and sources of funds for Bophelo operations.

14. Serve as the lead partner in working with outside evaluators.

NIP

1. Shall conduct quality assurance visits to each Bophelo van at a frequency no greater than once per month, at no cost to Pharmaccess or NABCOA.

2. Shall perform a confirmatory test on every 20th blood sample at cost to Bophelo and provide the results of such testing to Pharmaccess.

3. Shall promptly inform Pharmaccess and NABCOA of any changes in standard testing protocols.

Coordination of Partnership Efforts

Each partner shall designate a competent manager to be responsible for the partner’s activities in the Bophelo partnership. Such designee shall have the authority to assure compliance with the partner’s obligations under this Memorandum. The designee shall be reasonably available during business hours to respond to requests from other partners.

The designated representatives of the partners shall meet at an agreed time at least once per month to review the progress of the partnership and address outstanding issues.

Evaluation of the Partnership

The partners shall devote their best efforts to facilitate the analysis of data collected by Bophelo and the preparation of an independent evaluation of the outcomes of the program. All partners shall review and concur in the design of any evaluation of Bophelo outcomes. Pharmaccess Namibia shall manage collection of the data for such evaluations, provided that the incremental costs to any partner of collecting and analyzing additional data for the evaluation are covered by grants or other sources of funding not required for the ongoing operation of Bophelo. All partners to this agreement shall be consulted in the design of the evaluation, and a copy of the agreed evaluation plan will be provided to the Ministry. Evaluations shall be subject to the rules governing the ethics of operational research in medical care, and, if required, shall be submitted for review by research review boards in Namibia and at the entity which

BOPHELO Agreement 2009
conducts the evaluation. All parties will devote their best efforts to provide the data needed for the agreed evaluation design.

Non-Exclusivity

The partners have entered into this agreement to facilitate a joint effort to increase the rate of screening for key diseases and health conditions in Namibia. Nothing in this agreement shall preclude one or more of the partners from working with other parties to facilitate additional screening programs. However, no partner is specifically obligated by the terms of this agreement to provide support or assistance to such additional screening programs.

Term and Termination

This agreement shall be effective from January 1, 2009 and shall continue in force unless terminated by the withdrawal of one or more of the partners. Such notice of withdrawal must be submitted to all partners in writing at least ninety days in advance of the proposed date of withdrawal.

At least once per year, in the month of November, the parties shall meet and discuss the need for possible amendments to this agreement.

Agreed

<table>
<thead>
<tr>
<th>NABCOA</th>
<th>Pharmaccess Foundation</th>
<th>Namibia Institute of Pathology</th>
</tr>
</thead>
</table>

Signature: [Signature]

Name: [Name]

Title: [Title]

Date: [Date]

Agreement 2009
Appendix Two

Approval: Boston Medical Centre – Institutional Review Board
been obtained prior to initiating any research activities.

Sincerely yours,

[Signature]

[Name]
RITA-0759605
IRB Board Member

https://brase.humne.edu/app1/reports/hamanvar.asp?protocol=759596
3:39:2010
Appendix Three

Approval: Ministry of Health and Social Services Namibia

OFFICE OF THE PERMANENT SECRETARY

Ms. Ingrid de Beer
General Manager: PharmAccess Namibia
P. O. Box 9895
Windhoek
Namibia

Dear Ms. de Beer,

RE: Cost study on mobile and fixed site HIV testing.

1. Reference is made to your application to conduct the above-mentioned study.

2. The proposal has been evaluated and found to have merit.

3. Kindly be informed that approval has been granted under the following conditions:

3.1 The data collected is only to be used for operational purpose;
3.2 A quarterly progress report is to be submitted to the Ministry’s Research Unit;
3.3 Preliminary findings are to be submitted to the Ministry before the final report;
3.4 Final report to be submitted upon completion of the study;
3.5 Separate permission to be sought from the Ministry for the publication of the findings.

Yours sincerely,

[Signature]

PERMANENT SECRETARY

"Health for All"
Appendix Four

Literature


Marseille E., Dandona L., Marshall N., Gaist P. et al. HIV prevention costs and program scale: data from the PANCEA project in five low and middle-income countries. BMC Health Services Research, Volume 7, July 2007


Appendix Five

Model and user guide
May 2, 2010

To the User:

This workbook was created to provide a reference for other public health officials and accountants around the world to use for their own calculations and modeling of the cost of testing programs, particularly VCT for HIV. It was drafted while keeping in mind the ability for future users to adapt inputs, outputs and assumptions to their needs. The original structure of the current model was created as part of the study, “Comparison of Key Unit Costs and Outcomes for Mobile and Fixed Site Screening/Testing Programs in Namibia.”

The inputs used in this model were supplied through a combination of accounting data and interviews with program managers. The “Cost Elements” tab was designed based on the costs identified in the study design. This provided our team the direction needed to acquire the specific data to answer the questions listed in the study design. The cost section is organized around several components of the specific Namibia VCT programs, but can be modified to reflect different VCT program designs.

Cost and activity data should be collected for the same time period. Cost data should be based on actual expenditures, not budgets.

Input Parameters

In this model, Column E details costs for the Bophelo! mobile VCT program (which included testing for diseases in addition to HIV), and for the New Start program of fixed site VCT clinics.

The model requires inputs based on costs (local currency) and outcomes of each type of testing facility. As the model currently stands, there are several sample line items that the user can use which were based on the Namibia study, but these can also be edited and adapted for another costing project. If not needed, a row should be left blank but not deleted —formulas in the model are tied to specific rows that may not be readily visible to all users.

‘VCT Cost Elements’ (Tab 1)

Operations (cells E6:24, and F6:24)
Input the costs for each of the items it takes to run the VCT facility. You will see that there are several cells with “n/a.” This serves as an instruction to the user to be critical about which costs to include in the model for fixed site or mobile VCT programs, and which to leave out. If certain program elements are missing, the user may wish to leave additional cells blank.
The user will need to determine the expected useful life of mobile testing vans or fixed facilities. In Namibia, vehicle useful life was set at five years.

For each activity, the model applies an overhead rate to all of the direct costs for the activity. Where this was not available, we used an estimate (30%) based on comparable activities for which overhead costs are calculated.

Marketing (cells E31:35, and F31:35)
Input the costs for each of the items it takes for marketing and promotion. If marketing for the program is only part of one person’s job description, determine the percentage of that person’s time dedicated to marketing and multiply this by salary in order to find the appropriate input. Also, if an institution has an overall budget for media purchase or materials and VCT promotion is only a portion of the work, determine the appropriate percentage and multiply this by the budget to identify the appropriate input for the model.

Program Management (Cells E41:69, and F41:69)
In Namibia, operating costs were split between two organizations, with one organization’s costs shown under “operations” and the other here. If a single organization is responsible for all portions of program operations and management, the entire section can be used for all relevant cost data, and the other left blank. The input labels in the current model were based on cost elements in Namibia, but once the user can adapt individual lines or add lines with additional cost elements.

Quality Control (Cells E76:83, and F76:83)
In Namibia, these functions were performed by a separate (parastatal) organization. Costs in this section should include quality assurance and certification of VCT.

‘People Tested’ (Tab 2)

Hopefully, the testing program will maintain these data items in aggregate, or have anonymous files on each person tested. The measures shown below can then be readily determined without need to obtain personally identified data on persons testing positive.

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people screened (B4; D4)</td>
<td>Basic input for total number screened. If multiple sources of data, add up totals on a separate tab and ensure that the final amount comes in these cells.</td>
</tr>
<tr>
<td>Number of people tested for HIV (B5; D5)</td>
<td>This will be an important distinction to make as you collect your data. If you do not have enough data to make this distinction, ensure that “Number of people tested for HIV” is accurate before estimating a number for the “first time”</td>
</tr>
<tr>
<td>Number of people tested for HIV for the first time (B6; D6)</td>
<td></td>
</tr>
</tbody>
</table>
value. Be sure to state any assumptions you make in the comment section.

| Number of people tested positive (B7; D7) | Most programs may not make this distinction. The important thing is to obtain the number of people who test positive. In a VCT program, it is unlikely that those who have previously tested positive will test again. |
| Number of people tested positive for the first time (B8; D8) | |
| Number of people tested positive for the first time and never tested before (B9; D9) | |

‘Contributions’ (Tab 3)

Private Sector
One goal of the Namibia study was to determine the proportion of Bophelo! program costs carried by fees charged to participating employers. For VCT programs that charge a testing fee, a similar calculation could be performed. In this tabk, list the separate institutions that are contributing to the respective VCT program, and then input the appropriate amount (in local currency) for their contribution. Also note the source of data used for each entry.

Public Sector
The Ministry of Health (MOH) in the respective nation will likely have data on how much they are contributing to either program. For example, the MOH may be providing test kits, or some of the staffing for the center. However, it will be important to acknowledge if any other Ministries or Departments in the country are also contributing money and listing them here. In Namibia, this contribution came from the para-statal National Institute of Pathology

Domestic Donor
If there are local NGOs or other organizations that are contributing to the project, either in-kind services or cash, list them here. If In-kind services, make an approximation for their contribution and be sure to note how you came to that calculation.

International Donor
Global Fund to Fight AIDS, TB and Malaria, USAID, PEPFAR, DFID, Gates Foundation, and other donors from outside the country can be listed here. This may include direct cash contributions, or the value of certain items listed in Tab 1 which are contributed by the donor. Keep careful notes showing which portions of Tab 1 lines are reflected in these cells.

Output Tables and Charts

‘Primary Questions’
Provides table summary of answers to commonly asked questions about both delivery models. User can add more components to this section with corresponding formula calculations, and use this as an Executive Dashboard for senior stakeholders on each project.

**‘Mobile VCT Costs’ and ‘Fixed VCT Costs’**
Displays the distribution of costs of both types of VCT in pie chart form.

**‘Cost per Patient of VCT delivery methods’**
Compares Mobile VCT to Fixed VCT across column chart.

Please consider the following when making any adaptations and in reviewing results:

1. **Determine what you are trying to answer.** Put these in the “Primary Questions” tab and determine what is needed to calculate the value for each of these questions.
2. **State your assumptions.** The assumptions can either be listed directly in the tabs provided or on a separate tab. This may take the longest amount of time as you review the inputs and aim to fill in the gaps. The gaps we filled in our data were based on reasonable assumptions based on our experience in the field on previous global health projects. Be sure to also state where you are making assumptions so that another user can trace back and re-create your work if necessary.
3. **If you add more formulas and rows to the worksheets,** ensure your formulas work. Utilize the “Formula Auditing” functions and Name Assignment features of Excel in order to keep consistent data across different tabs. Also make sure that there is no double counting of rows, which can create a multiplier effect for the costs.
4. **Use your common sense when reviewing the results.** Compare results on your personal experience with the projects. If you find that it costs you over US$20,000 per patient for operating a multi disease screening program, and this contradicts your own personal experience, then you may have a formula error.