INTENSIFYING ACTION TO ADDRESS HIV AND TUBERCULOSIS IN MOZAMBIQUE’S CROSS-BORDER MINING SECTOR

Katy Barwise, Andrew Lind, Rod Bennett, and Emilia Martins

The southern provinces of Mozambique have some of the world’s highest recorded levels of HIV and tuberculosis (TB). They are also characterized by high levels of cross-border migration, particularly to mines in South Africa. Through the Declaration on Tuberculosis in the Mining Sector in August 2012, heads of state of the Southern African Development Community showed an increased commitment to addressing TB and HIV among migrant mine workers, but there is much left to do. This article analyzes the importance of recent policy developments, both regional and national. We report new research from 2011–2012 on health-related attitudes and behaviors of Mozambican mine workers and their families and present an estimate of the financial burden of disease related to migrant mine work for Mozambique’s public services and migrant-sending communities. We recommend that the Declaration be operationalized and enforced. Practical measures should include training of health workers in migrants’ right to health; user-friendly health information in Portuguese and local languages; building the advocacy capacity of mine workers’ representatives; and more attention to social, cultural, and economic factors that affect migrant mine workers’ health, including better access to health information and services and livelihoods for wives, widows, and orphans in communities of origin.

Throughout South Africa’s 150 years of mining, mines have attracted migrant workers from neighboring countries. Some migrant mine workers settled permanently in homes close to the mines. However, most mine workers keep their
primary homes in their places of origin, where their wives and children live. Although mine worker-sending countries and communities earn economic benefits from the export of migrant labor, tuberculosis (TB), silicosis, and HIV have reached epidemic proportions among the communities from which migrant mine workers originate. In the case of HIV, the epidemic has severely impacted migrant-sending countries such as Mozambique and Lesotho. These two countries supply more migrant mine workers to South Africa than other countries: each has around 35,000 active migrant mine workers in South Africa. A recent study by the International Organization for Migration (IOM) estimates that the financial burden on Mozambique of the migration-related health impact in mine-sending communities could be more than $800 million (all dollar amounts in U.S. dollars) per year. Another recent IOM study illustrates the importance of social, cultural, and economic factors impacting the health of migrant mine workers, their sexual partners, and their wives and children who stay in Mozambique.

Until recently, the response of public policy in both countries has been inadequate (1). According to the South African Tuberculosis National Strategic Plan 2007–2011, 90 percent of reported occupational lung diseases in South Africa arises from the mining industry, and the South African Gold Mining Industry probably has the highest incidence of TB in the world (3,000–7,000 per 100,000 population per year) (2). Additionally, the South African system for compensation for respiratory illnesses in the mines—the Occupational Diseases in Mines and Works Act 1973—has major funding issues and backlogs, with experts estimating that at least 280,000 men are eligible for compensation (3). For migrant mine workers and/or their families from neighboring countries working in South Africa, language barriers, lack of citizenship, and the need to travel long distances to file claims make compensation management even more difficult.

Acknowledging these problems, on August 18, 2012, Southern African Development Community (SADC) heads of state committed to address the TB epidemic among current and ex-mine workers, their families, and affected communities, by signing the SADC Declaration on Tuberculosis in the Mining Sector (4). The Declaration commits SADC governments to: (i) strengthen coordination and collaboration at national and regional levels; (ii) create a supportive policy and legislative environment; (iii) strengthen programmatic interventions and improve outcomes; (iv) strengthen surveillance systems; (v) strengthen monitoring and evaluation; (vi) strengthen mechanisms for financing TB interventions in the mines to control TB in the mining sector; and (vii) promote a research and development agenda.

While the regional Declaration was being developed, there were also developments at the national level in Mozambique. A high-profile working group coordinated by the National AIDS Council, with membership from the Ministry of Health and the Ministry of Labour, mine workers’ representatives, the mining industry,
and intergovernment organizations, developed a draft national action plan to improve the health care of cross-border Mozambican mine workers.

The importance of these parallel developments should not be underestimated. Both the regional Declaration and the draft national action plan demonstrate newfound commitment from policymakers to address a century-old “policy stalemate” that has facilitated the spread of HIV and TB epidemics in the southern African region—home to the highest rates of HIV in the world.

The IOM provided technical assistance to SADC to coordinate the development of the Declaration on Tuberculosis in the Mining Sector, while simultaneously providing support to the Mozambican Technical Working Group on Healthcare for Cross-Border Mineworkers. IOM’s strategic objectives on migration health are derived from the 2008 World Health Assembly Resolution on the Health of Migrants (WHA 61.17). The WHA 61:17 recognizes that health outcomes can be influenced by multiple dimensions of migration and notes that some groups of migrants experience increased health risks. Among other elements, it calls upon member states to promote migrant-sensitive health policies, train health professionals to deal with health issues associated with population movements, and promote bilateral and multilateral cooperation on migrants’ health among countries involved in the entire migratory process. This article summarizes actions and research undertaken by IOM in Mozambique to support the government in developing strategies and policies to operationalize parts of the WHA, in particular to address HIV and TB among Mozambican migrant mine workers and their families.

We begin with an analysis of the size and scope of the HIV and TB problem in the context of cross-border labor migration to the mines. We then present the findings of two IOM research projects: (i) with mine workers and their widows in Mozambique and the cross-border mining sector in Mozambique and (ii) an estimate of the financial impact of migration-related HIV and TB on Mozambique. Lastly, we examine recent public policy pronouncements. The article concludes with a set of recommendations to address the main gaps and needs identified.

HUMAN AND ECONOMIC COSTS OF MINING

HIV, TB, and Mozambique’s Cross-Border Mining Sector

The mining industry in South Africa is dependent on migrant labor. Workers come from other provinces of South Africa and from neighboring countries (Mozambique, Lesotho, and Swaziland in particular). This pattern has existed

1 Full membership of the group was: National AIDS Council, Ministry of Health, Ministry of Labour, Mine Workers Association (AMIMO), TEBA, International Organization for Migration (IOM), United Nations Joint Programme on AIDS (UNAIDS), and World Health Organization (WHO).
throughout the 150-year history of the mines, and the entrenched culture of circular labor migration has characterized the social and cultural makeup of the communities from which migrants originate, as well as the epidemiological profile of their populations. The primary mine worker recruitment agency, TEBA Ltd., has around 35,000 Mozambican workers in mines in South Africa, traveling back and forth from their communities of origin in Maputo, Gaza, and Inhambane Provinces throughout the year. At the Mozambique National Consultation on TB in the Mines, February 22, 2012, the mine workers association, Associação Mineiros Moçambicanos (AMIMO), estimated there may be up to the same number of mine workers in South Africa who are not recruited by TEBA—another 35,000 or so, which would make around 70,000 in total.

An estimated one-third of TB infections in the region are linked to mining activities: 3,000–7,000 per 100,000 of the population in some areas (7), with an 80 percent HIV co-infection rate. It is estimated that each migrant worker who returns home with TB transmits the disease to 10 to 15 people in the community. Recent reports from the Provincial Health Offices in Maputo and Gaza Provinces (where almost all migrant mine workers originate) revealed rising numbers of reported TB cases (for example, see Figure 1) and a 70 percent to 80 percent co-infection rate with HIV (15). Carmelo Hospital, the primary health care facility in Chokwe District, Gaza Province, has an electronic database record starting

![Figure 1. TB cases in Carmelo Hospital, Chokwe District, Gaza Province, Mozambique.](image-url)
in 1996. The number of TB cases treated per year more than doubled from 718 cases in 1996 to 1,520 cases in 2011.\(^2\)

HIV prevalence is high among mine workers in South Africa and neighboring countries. In Mozambique, the provinces from which mine workers originate (Maputo and Gaza in particular) have the highest HIV rates in the country. In Gaza Province, one in every four adults is living with HIV, and in Maputo Province, one in every five (8). These figures are markedly higher than other provinces in the country (Mozambique’s national adult prevalence is 11.5%), and they are closer to the national rate among adults in Swaziland, which was estimated at 25.9 percent in 2009.

The links between the mining sector, migration, and the HIV epidemic are well documented.\(^3\) In a study of Swaziland and Lesotho, Corno and de Walque offer three main channels for increased risk of HIV infection in migrant mine workers, all of which are a consequence of their migration.

First, working in South African mines implies temporary, long-term migration from the household of origin, which increases the probability of engaging with multiple sexual partners. Second, miners have traditionally been accommodated in single-sex hostels, and this has boosted an active sex industry in areas surrounding mining sites, where miners have disposable income to engage in sexual relationships with commercial sex workers. Finally, women, who wait for their husbands to come back from the mines, might be more likely to engage in sexual relationships with other partners as well (9).

Assessment of 65 Mine Workers’ Knowledge, Attitudes, and Behaviors

The research presented here, conducted by IOM, supports the three channels for increased infection described above by Corno and de Walque (9). Between December 2011 and January 2012, thousands of Mozambican mine workers returned home for Christmas, mostly passing through the small town of Ressano Garcia on the South Africa/Mozambique border. During that time, IOM and

\(^2\) One could possibly attribute the increased caseload to increased surveillance and to active seeking/improved diagnosis of patients if not for the fact that the numbers progress at an almost linear rate. The only exceptions are 2000, 2006, and 2009, when the rate decreased from the previous year, but continued upward in the year after. Further, that rate does not significantly spike in any particular year, diminishing the possible effect of a particular training or active seeking program.

AMIMO interviewed 65 current and ex-mine workers, some as they waited to pass through the border back into Mozambique, a process that can take several hours, and some during a mine worker gathering in Xai-Xai, the capital of Gaza Province. A mixture of qualitative and quantitative research tools were used to assess migrant mine workers’ perceptions, attitudes, and reported behaviors on issues relating to access to health services and social determinants of health. The main tool was a questionnaire, with a combination of open-ended and closed questions. At the same time, seven in-depth interviews were carried out: four with active mine workers, one with a retired mine worker, one with the widow of a mine worker, and one with a mine worker’s wife. The survey revealed that 80 percent of the 65 mine workers interviewed see their wives between every three months and once per year (Table 1).

In interviews and open-ended questions, respondents (migrant men) indicated that being away from their wives is a challenge and leads to loneliness. “It is very difficult to be away from home with strange people. You have to do a lot of things. Sometimes we drink to forget the home we miss.” In a one-on-one interview, one mine worker said the work: “…affects my marriage significantly, because you should not stay a long time away from your wife, because you end up sleeping with another woman. I always call my wife to come visit me in South Africa, two to three times a year, but when she leaves to go back to Mozambique I suffer. I don’t know what I can do to spend more time with my wife. I think they should give our wives more than a one-month visa.”

Another mine worker says: “It’s like everyone knows that a car can kill, but people still buy them. It’s the same with sex: you know that from unprotected sex you can be infected and die, but men still pay to sleep with prostitutes. … Being away from your wife, and having women that want to have sex with you, makes you have those risky behaviors. [But] having many women in South Africa causes problems for you in Mozambique because you spend all the money on them, and you can’t send money to your family.”

Table 1

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Every day</td>
<td>2.4</td>
</tr>
<tr>
<td>Every week</td>
<td>2.4</td>
</tr>
<tr>
<td>Once a week–once a month</td>
<td>12.2</td>
</tr>
<tr>
<td>Once in every 3 months</td>
<td>61.0</td>
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<tr>
<td>Once in 6 months</td>
<td>14.6</td>
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<tr>
<td>Once a year</td>
<td>4.9</td>
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Of those participating in the questionnaire, 65 percent live (or, if retired, lived) in single-sex hostels when they are or were in South Africa (Table 2). Active mine workers have more housing options in South Africa than retired workers had when they were working: around 96 percent of retired mine workers lived in male hostels when they were working in South Africa, and 32 percent of the active mine workers interviewed currently live in rented houses.

The fact that 12.2 percent of the mine workers interviewed own their homes could indicate behavior changes related to removal of control and homeland policies since the apartheid era in mining communities, as well as an interest in settling down. Nevertheless, accommodation in male hostels is still common (46%) among the active mine workers we spoke to, and local rental may not be a major improvement. Only one mine worker did not own a house in Mozambique, and all of them consider Mozambique to be their primary home.

Many of those interviewed said they did not feel well treated by hospitals and health services in South Africa. Some said that, when sick, they preferred to go home to recover—or die—with their families. Others said they did not trust the health clinics in the mines, often seeking private services, but ended up returning home since treatment in private hospitals in South Africa is expensive. “One of the big problems is the fact that Mozambicans don’t have health insurance or medical aid, so when you are sick you only rely on the company clinic and they treat the Mozambicans badly. There is so much discrimination; some say that we are taking their jobs.”

Half of the interviewees talked about xenophobia (Table 3). “In South Africa, Mozambicans face a big problem of discrimination. South Africans don’t like

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<th>Table 2</th>
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<tr>
<td><strong>Types of workers’ housing in South Africa and Mozambique</strong></td>
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<tr>
<td></td>
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<tr>
<td>In what type of house do/did you live in South Africa?</td>
</tr>
<tr>
<td>Male hostel</td>
</tr>
<tr>
<td>Mixed hostel</td>
</tr>
<tr>
<td>Own house</td>
</tr>
<tr>
<td>Rent house</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>In what kind of house do/did you live in Mozambique?</td>
</tr>
<tr>
<td>Own house</td>
</tr>
<tr>
<td>With family members</td>
</tr>
</tbody>
</table>
Mozambicans, they treat them bad, we don’t feel good in South Africa; in Mozambique we feel a lot better.”

It may be preferable for some, therefore, to access health services in Mozambique (Table 4): “The main health problems faced by miners are TB and AIDS, but in South Africa they become bigger with the discrimination by the medical staff on knowing that you are not South African. In Mozambique, miners have better treatment because we are not discriminated.”

To summarize, findings suggest that social, cultural, and economic issues around migrant labor need to be given at least as much attention as pure health factors if the TB and HIV epidemics are to be stemmed, and interventions need to take place throughout the migration cycle (origin, transit, destination, and return) with both mine workers and their families and communities. The channels for increased risk of infection (multiple partners, second wives, vulnerability of wives in sending communities) have not significantly changed over time. Further, mine workers have their own rational reasons for seeking treatment (or foregoing

| Table 3 | Xenophobia in South Africa and Mozambique |
|-----------------|-----------------|-----------------|-----------------|
|                | Active (%)      | Retired (%)     | Total (%)       |
| Are there cases of xenophobia against Mozambican mine workers in South African hospitals? | Yes | 48.8 | 50.0 | 49.2 |
|                | No | 46.3 | 29.2 | 40.0 |
|                | Don’t know | 4.9 | 16.7 | 9.2 |
|                | No answer | 0.0 | 4.2 | 1.5 |

| Are there cases of stigma against Mozambican mine workers in Mozambican hospitals? | Yes | 29.3 | 33.3 | 30.8 |
| No | 48.8 | 58.3 | 52.3 |
| Don’t know | 22.0 | 4.2 | 15.4 |
| No answer | 0.0 | 4.2 | 1.5 |

| Table 4 | Survey Question 34: Where do you prefer to receive the treatment? Why? |
|-----------------|-----------------|-----------------|-----------------|
| Reasons by those answering Mozambique (71%) | Responses | Percentage |
| I prefer to be close to home, close to my family. | 27 | 42 |
| I receive better treatment and medicine. | 16 | 25 |
| The cost of treatment is lower. | 3 | 5 |
treatment) that are based on a combination of distrust of mine clinics and a desire to “be home” with their families when sick. Finally, they underline the discrimination that some Mozambicans feel they face when they seek to use local facilities in South Africa. This may impact their contractual and human rights to health care in their places of work.

Estimating the Cost of Labor Exports to Mozambique’s Public Services

The evidence from interviews with mine workers set out above, and earlier studies on the health costs of migrant labor, have been supplemented by research undertaken in August and September 2012. This second study investigated the possible financial burden on the Mozambican health system of health problems caused by cross-border migration. In addition to the direct financial burden from sick mine workers returning to their communities of origin for treatment, there is a public health impact: cross-border migration may lead to a disruption in treatment as the health system in Mozambique is not designed for referral and absorption of cases from South Africa. Often, this means more medical examinations, changes in treatment or delays, and decreased efficacy of treatment as a result of abandonment. This can lead to drug resistance and consequent increases in morbidity and mortality. Drug resistance and abandonment (causing viral spikes) also increase the rate of infection for HIV and TB in migrant-sending communities.

METHODS

For a detailed explanation, including the methods used to achieve a “best possible” analysis, see Appendix 1.

The costing tool—which will be used by the Ministry of Health—creates a dashboard that provides information about mining-related increases in disease burden and subsequent costs of treatment. To provide the data, it uses national HIV statistics (8) along with district health office reports about TB and HIV co-infection rates in some districts in the most affected provinces: Gaza and Maputo. Life expectancy models and epidemiological estimates were created using evidence from a study on Basotho mine workers (a similar cohort) and background data from the National Institute for Occupational Health (South Africa), particularly information on disease burden, morbidity, and mortality in relation to the impact and multiplicative effect of co-infection with silicosis, TB, and HIV (10, 11). On the assumption that a South African embargo on new Mozambican mine worker recruitment holds—and using the rate of decrease based on annual data from TEBA Ltd.—the life expectancy results lead to a survival model through 2034.
The above datasets are linked to costing estimates derived from the World Health Organization (WHO), South African statistics, and assumptions based on purchasing power parity in Mozambique. Service delivery, treatment costs, and compensation are linked to cohort estimates, providing a fuller picture of the disease burdens’ related resource demand and costs in southern Mozambique (Inhambane, Gaza, and Maputo Provinces).

Conclusions of the Costing Study. Many of the original infections for both HIV and TB that are now endemic in Mozambique were related to migrant work. The study found that the burden of disease that is apparently directly attributable to migrant mining today is costing Mozambique $840 million per year. We further estimated the total cost of unpaid compensation to former mine workers and widows to date (this is the amount that should be paid out to the ex-mine workers and their widows that we estimate are alive today) of $96.6 million, with an additional ongoing annual loss of $56.2 million if changes are not made to the management of the mines and the support for mine workers (13). Even allowing for statistical anomalies such as the difference between purchasing power parity and standard exchange rates, this is a significant burden on a country whose gross domestic product was estimated by the World Bank at about $13 billion in 2011.

Analysis of the burden of disease of HIV and TB in the three regions of Mozambique shows clear differences that can be attributed to the external influences of cross-border traffic in the main corridors and the migrant and seasonal labor markets in South Africa.

In Figures 2 and 3, the baseline is the underlying level of HIV and TB that exists without the impact of transport corridors or migrant labor, as is the case in the northern region of Mozambique. The central region has major trucking routes (the “Corridors”) from neighboring countries, but does not have significant migrant mine workers (1,300 of 37,800 mine workers). The higher level of TB and HIV in this region is attributable to this. The “other migrants” category is the estimated number of agricultural seasonal workers into South Africa, calculated by extrapolation from an IOM 2010 study on commercial farms in South Africa (12). The agriculture and mining sectors can be considered responsible for the additional burden in the southern region. This is a conservative estimate, since the old Beira corridor is more heavily used than the Maputo corridor. When we refer to the “regional burden,” we mean the burden of disease in the southern region compared to the northern (baseline) region.

To convert this conservative estimate of the burden of disease into the financial impact, we costed the following discrete elements: the cost to the health system of treating the regional burden; treating the mine workers and their dependents (the current cost, the projected future cost if nothing is done, and the projected future cost if current SADC agreements are implemented); and the cost of finding, treating, and compensating ex-mine workers and their widows.
Figure 2. Burden of HIV by region.

Figure 3. Burden of TB by region.
Population-Level Regional Burden. The total population of Mozambique is nearly 24 million. Of this, about 5.5 million are in the southern region. The population of mine worker-sending communities is about 250,000 (about 37,000 mine workers and 210,000 ex-mine workers and direct dependents). The total southern region burden attributable to mining represents only 4.2 percent of the total national burden of HIV and 13.2 percent for TB. The higher percentage for TB is because of the higher HIV and the impact of silicosis as multipliers of TB incidence. The costs to treat HIV (based on current UNAIDS projections) include all ART for those on treatment and primary health care and hospital care for opportunistic infections pre-treatment and treatment.

Projected Future Cost Implications. Because of the South African legislative embargo on employing new miners from SADC countries, we estimate it is likely that the number of migrant Mozambican miners will diminish to zero by 2034. From Tables 5 and 6, it can be seen that the mining communities’ burden now

<table>
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<th>Number of cases</th>
<th>Cost to treat ($ millions)</th>
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</thead>
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<tr>
<td>HIV</td>
<td>185,203</td>
<td>367.45</td>
</tr>
<tr>
<td>TB</td>
<td>6,389</td>
<td>22.31</td>
</tr>
<tr>
<td>Total</td>
<td>188,398</td>
<td>389.76</td>
</tr>
</tbody>
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Notes on cost assumption: these costs represent the full costs of treatment, assuming the hospitals and hospital staff have been increased in proportion to the disease burden. Marginal costs for regional and mining communities’ burden would be $20.92 million and $23.86 million, respectively.

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represents only 20 percent of the regional burden of HIV, TB, and silicosis in terms of numbers. This means that the reduction of numbers of mine workers alone will have little impact and there will be only a slight reduction in both the regional burden and the mine worker-sending communities’ burden of disease over a much longer period. If HIV infection in mine workers is reduced by 50 percent, that is only 10 percent of total incidence.

However, in the context of SADC as a whole, the Mozambican migrant mine workers and their families form part of a much larger, complex, internal and cross-border sexual network, not least because of the transport corridors that link countries in the SADC region. Thus, without action (i.e., the full package of HIV and TB prevention programs) in Mozambique’s mine worker-sending communities and transport corridors, regional efforts in all countries would be much less effective than a coordinated approach (in both sending and receiving countries).

Compensation. For ex-mine workers and their widows, there are also costs associated with compensation, as shown in Table 7 (legally, widows are allowed compensation/pension if their partner dies within 12 months of medical boarding). Here we have estimated the number of compensable mine workers alive in 2012, who would contribute to the historic cost. The annual ongoing cost relates to the current number of miners who would be eligible for compensation. This annual cost will steadily reduce as the number of mine workers declines over the next 20 years.

THE EFFECTIVENESS OF NATIONAL AND REGIONAL POLICY DEVELOPMENTS

South African Development Community Declaration on Tuberculosis in the Mining Sector

The Declaration signed in August 2012 is comprehensive, and a Code of Conduct to assist its operationalization is expected to be passed at a later date. The preamble

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<tr>
<th>Regional burden</th>
<th>Number alive</th>
<th>Compensation ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miners (annual, reducing)</td>
<td>5,830</td>
<td>52.58</td>
</tr>
<tr>
<td>Ex-miners (to 2012)</td>
<td>7,076</td>
<td>63.81</td>
</tr>
<tr>
<td>Widows</td>
<td>2,510</td>
<td>32.95</td>
</tr>
<tr>
<td>Seek and support</td>
<td>9,586</td>
<td>0.73</td>
</tr>
<tr>
<td>Total historic cost</td>
<td>9,586</td>
<td>97.94</td>
</tr>
</tbody>
</table>
of the Declaration is frank, highlighting the exceptional mineral wealth in southern Africa and the fact that mine workers significantly contribute to economic development as a result. It acknowledges that—in part because of the health effects of mining—the region has higher TB, HIV, and co-infection rates than anywhere in the world. It then lists the various international standards and practices to which states in the region are party, before going into the components of the instrument itself: strengthening accountability, coordination, and collaboration at national and regional levels; promoting a supportive policy and legislative environment; strengthening programmatic interventions; strengthening disease surveillance; strengthening program monitoring and evaluation; and strengthening financing.

The Declaration has been greeted positively. Quoted in *The Lancet* in October 2012, Joel Spicer, Stop TB senior strategist, said, “[The] ‘extremely high level of political will’ expressed by heads of state in the Declaration may serve to amplify the call for change and for renewed leadership” (5), a response that reflects the feelings of others, especially in the area of compensation for occupational diseases (6). The Declaration commits governments to ensuring that employers take full responsibility for management of occupational diseases, including during retirement.

According to Rantso Mantsi of the Lesotho Ex-Mineworkers Association, “The Declaration comes at a time when ex-miners, desperate to get their compensation for contracting occupational diseases, fall victim to lawyers that rip them off. They charge heavy fees and when the claims go through most of the money goes to pay for the legal fees. That will come to an end now that governments are taking the responsibility to assist their men who have served in the South African mines” (6). The general positivity no doubt reflects the fact that the Declaration was developed with input from civil society organizations, including labor representatives.

*National Action Plan for the Health Care of Cross-Border Mozambican Mine Workers*

In 2007, the Mozambican Ministry of Labour led a mission to South Africa to discuss with the Chamber of Mines the need for projects and funding for the provision of services for active, retired, and returning miners with respect to TB, HIV, and other occupational illnesses. In 2008, the first Regional Conference of the Association of Miners of Southern Africa was held in Maputo, with the participation of the Ministry of Labour, Ministry of Health, and the National AIDS Council. After the conference, the Ministry of Health proposed that the Technical Working Group continue to finalize an action plan that focused on improving health services and referrals in South Africa and Mozambique.

In 2012, as part of the broader regional process, the Ministry of Health hosted a one-day National Consultation on TB in the Mines of South Africa.
Representatives from the Ministry of Labour, the National AIDS Council, SADC, international organizations, nongovernment organizations, employers, and employees were present. The final recommendations of the Consultation led to the development of much of the national action plan and, since it was undertaken in preparation for SADC meetings to discuss the regional Declaration, they also helped to define the position of Mozambique with regard to SADC activities.

The national plan of action has been finalized at the technical level and is currently awaiting presentation to ministers. It covers several actions similar to the regional Declaration and is broken down according to which ministry/department is responsible for what, presented in three main areas:

1. Legislative Rights Actions: Miners, their civil society representatives, and government officials often do not understand their rights, roles, and responsibilities with regard to health systems, services, and compensation in the context of cross-border labor migration. The policy-level interventions in the action plan aim toward: (i) cross-border coordination with the Ministry of Health through representatives of the Ministry of Labour based in South Africa; (ii) education and awareness programs for miners in South Africa and Mozambique; and (iii) dissemination of signed codes of conduct and regulations implemented at the regional level.

2. Health Services: Health services for cross-border miners and monitoring and treatment services to prevent the spread of communicable diseases to the public continue to be the main responsibility of the Ministry of Health. These actions will benefit even more from potential financial support from the Chamber of Mines of South Africa and will include: (i) designing interventions as pilot projects and budget requests to the Chamber of Mines and (ii) improving the surveillance of communicable occupational illnesses of miners, particularly of Multi-Drug-Resistant TB and Extreme Drug-Resistant TB, as well as ensuring access to care and treatment.

3. Social Interventions and Prevention: The social and financial services and the disease prevention activities include a variety of stakeholders from government, civil society, nongovernment actors, and researchers. The National AIDS Council, in its role as coordinator of these organizations, particularly for behavior change and social interventions, will coordinate activities to increase awareness of risk to miners and their families and to increase the capacity for behavior change and adoption of healthy, positive choices.

CONCLUSIONS AND RECOMMENDATIONS

The recent steps forward in regional and national policy to address what has been described as a “one-hundred-year-old policy stalemate” (1) are significant. The Declaration marks a continuation of the strong commitment of SADC and its
member states—including the government of Mozambique—to address the HIV emergency in the region. It also is a huge step forward in formulating a response to curb the TB epidemic in a historically marginalized group.

States must now ensure these commitments are operationalized. Civil society must hold governments and the private sector accountable for commitments. As we have demonstrated, in addition to the direct health vulnerabilities of being a cross-border mine worker, the particular migration dynamics of the sector mean that specific social, cultural, and economic determinants of health must also be addressed. Additionally, interventions must be done in communities of origin (in Mozambique), during transit (along migration corridors), and at destination sites (in South Africa) if they are to be effective at curbing the HIV and TB epidemics in Mozambique and South Africa.

In addition to endorsing and implementing the Code of Conduct of the Declaration, we recommend that the following actions—in line with the WHA 61:17—be prioritized:

1. Strengthen regional and national coordination mechanisms to: (i) promote bilateral and multilateral cooperation on migrants’ health among countries involved in the entire migratory process and (ii) gather, document, and share information and best practices for meeting migrants’ health needs in countries of origin or return, transit, and destination.

2. Conduct migration sensitivity programs and training in migrants’ rights with health workers in mine worker-sending and mine worker-receiving communities, referring to the 2008 World Health Assembly resolution on migrant health and to national (Mozambique and South Africa) policy and legislation (14).

3. Provide migrant mine workers with more information about their right to health in South Africa. Information should be provided in appropriate language and format—including written and spoken Portuguese and Changana—and delivered through localized media, rather than simply distributed in written form or explained didactically.

4. Build the capacity of mine workers’ associations/representatives to advocate for their constituents and to monitor implementation of the SADC Declaration. Capacity-building should be technical, in health and human rights, as well as institutional/organizational, particularly in financial management and in monitoring and evaluation.

5. Mozambique and other labor-sending countries should finalize and endorse their national-level plans to operationalize the commitments in the SADC Declaration, including developing plans to cover mine-related costs to health and social services. In particular, per the Declaration, sufficient funding from governments and mining companies for programmatic interventions for TB, HIV, silicosis, and other occupational respiratory disease and for compensation obligations must be secured.
6. All stakeholders need to do more to address specific migration-related determinants of health: multiple partnerships, living and working conditions, and migrants’ wives’/families’ vulnerabilities. The first of these would be decreased if the second two were successfully addressed. More family-friendly facilities and healthy recreational activities at mine sites is one possible solution, along with provision of contracts that could let mine workers see their families more frequently. This could involve advocating for longer-term visas for mine workers’ wives so they can visit more regularly or facilitating more frequent travel home.4 A comprehensive cross-border social change communications program relating to multiple partnerships should be implemented—with the same “branding” in mine worker-sending communities, along transit routes, and in mine worker-receiving communities.

7. Policymakers should move away from policies and programs that conceptualize mine workers as “most at-risk populations” and move toward inclusive policies that acknowledge migration as a structural factor that increases risk of not only individual migrants, but also migration-affected communities. Holistic programs such as empowerment of mine worker-sending communities and the families left behind, including access to livelihoods for wives and widows of cross-border mine workers, is as important as implementing programs to address the health of individual migrant workers themselves.

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**APPENDIX 1: THE COSTING STUDY METHODS**

This study, funded by Programme Acceleration Funds from UNAIDS and conducted for IOM by Rod Bennett of HEXOR Ltd, built on previous research on the regional impact of TB, HIV, and other health vulnerabilities due to migrant mining in South Africa as background for the March 2012 SADC Declaration and Code of Conduct on TB in the Mining Sector (*Costing of Potential Policy Choices to Eliminate TB from the Mines in SADC Region*. Unpublished report sponsored by World Bank. February 2012.

The follow-up study in Mozambique focused on the burden of TB, HIV, and silicosis among Mozambican migrants who work or have worked in South African mines, or nearly two-thirds of Mozambique’s cross-border migrant workers (most of the rest work in agriculture in South Africa). It estimates costs of: (i) treatment
at population level, (ii) treatment of the historic and ongoing cohort of miners, and (iii) cost impact of further consequential infections within origin communities, including care for orphaned children. The study was done in two stages: data-gathering and computer-modeling.

Building up a statistical dataset started with published data, including checking validity as far as possible. Published information was inadequate for the purposes of this study. We accessed unpublished data via semi-structured interviews with key individuals and groups in both Mozambique and South Africa; these interviews yielded not only core data but also evidence on interviewees’ perceptions. We cross-checked with data on migrant mine workers within South Africa and Lesotho and, where necessary, extrapolated from South African/Lesotho data to fill gaps. The source of occupational diseases in these two countries is the same as in Mozambique (South African mines and mining communities). All three countries provide significant numbers of miners to the gold mines, the source of silicosis. The social determinants of disease are similar in Lesotho and Mozambique as mine workers come from poor, rural communities in both countries. Mozambique’s population is 11 times that of Lesotho, but most Mozambican mine workers come from 20 districts in the southern provinces that are home to about one-quarter of Mozambique’s population.

Data from TEBA in Johannesburg on current numbers of Mozambican mine workers were confirmed in TEBA’s Maputo office and Xai-Xai provincial office. Numbers and locations of surviving ex-miners were extrapolated from a survey by TEBA in Xai-Xai of a single labor-sending village anecdotally considered to be representative of many mine worker-sending communities: this provided figures for current miners, ex-miners, and non-mining migrant workers for one town and indicated proportions for the entire mine-working community. The National Institute for Occupational Health in Johannesburg has provided much of the background research, particularly information on morbidity and mortality in relation to the impact and multiplicative effect of co-infection with silicosis, TB, and HIV. Other sources of information and interviewees included: AMIMO (data still too limited for statistical robustness, but providing useful information on surviving ex-miners and non-TEBA migrant mine workers); Ministry of Health and Ministry of Labour (national data and policy perspective); African Centre for Migration and Society in Johannesburg (broader context of migrant labor and other possible sources); Provincial Health Directors of Gaza and Maputo, the two provinces that, along with Inhambane, carry the highest burden of disease; district health service officials in two districts from each of those provinces (Bilene, Chokwe, Marrucene, and Manhiça); and IOM in Pretoria and Maputo (data and wide-ranging/informal discussions). Where demographic or disease-related data were not available, these were sourced from WHO and UNAIDS Global Reports, provided that we were satisfied these data were credible. For example, costing data for treatment of inpatients, outpatients, and those in primary care were taken from the WHO-CHOICE database (2008).
However, we concluded that the WHO’s Mozambique figure on this particular item ($5 per inpatient day) needs upward revision and we adopted a different figure, set at 39 percent of the WHO-CHOICE $101 figure for South Africa (based on the relative cost of staff in the two health systems and taking into consideration relative activity levels [health visits per capita], numbers of staff per 1,000 population, nurse/doctor ratios, and salary levels for the two countries).

In the second stage of the study, a Microsoft Excel-based model was constructed with the following analytical frameworks:

1. National HIV and TB broken down by region and province
2. Numerical burden of miners/population with HIV and TB in each district (where known)
3. Life expectancy based on research data for Basotho gold miners (10, 11)
4. Survival model using the historic profile of miners over time to determine likely numbers of ex-miners and widows still alive
5. An HIV/TB/silicosis model to determine the contextual extra risk (the sum of the additional exposures created by working environment, after-work activities, and residential environment) incurred by miners, ex-miners, their partners, and their children to determine likely levels of HIV and TB for given levels of co-infection
6. Relative staffing costs to provide a basis for unit costs of service delivery (instead of WHO-CHOICE figures) (per bed-day and outpatient visit)
7. Treatment costs for miners and dependents for each of TB, HIV, and silicosis and additional treatment costs in the region attributable to increased burden of TB and HIV from mining, based on the number of cases derived from the modeling compared to the total cost of treatment of all TB, HIV, and silicosis in the region
8. Costs of annual and historic compensation due to miners of mining families

The analysis includes discussion of assumptions and sensitivity testing. Most of the sensitivity tests we conducted have little impact on our conclusions on the overall cost burden of $840 million per year. However, there are roughly three times as many doctors and twice as many hospital beds per person in the southern region as in the central and northern regions of Mozambique, and we believe that higher health care staffing and capital costs in the southern region have been incurred because of the concentration of HIV, TB, and silicosis linked to mine work in that region: total costs, rather than merely marginal costs, is the most appropriate measure. An estimate of the burden based only on the marginal costs of each new mine worker patient (e.g., for drugs) would produce a figure more than 80 percent lower than our $840 million estimate. The model is also very sensitive to changes in figures for the cost of care and drugs, which need further research if they are to be robust. If the WHO $5 per day figure were to be used for treatment costs, the $840 million cost burden would again fall by more than
80 percent. On the other hand, if the estimate were to be based on purchasing power parity-adjusted South African costs, the cost burden would be nearly 70 percent higher. More research is needed, but in our view, any adjustment of our costings on these grounds is likely to be upward.

APPENDIX 2: THE MINE WORKERS ASSESSMENT

Funded by Programme Acceleration Funds from UNAIDS, this study investigated the attitudes, perceptions, and reported needs/behaviors of active and retired cross-border migrant mine workers and their partners. It built on previous research (e.g., Davies et al., 2011; IOM, 2010a and 2010b). The study was preceded by focus group discussions with non-active (retired) mine workers.

Late in December 2011, 35 interviews were conducted in the secondary school in Xai-Xai, the capital of Gaza Province, in parallel with an AMIMO strategic planning meeting. However, few active mine workers participated. So, early in January 2012, a further 30 interviews were conducted at the border crossing in Maputo Province, Ressano Garcia, with mine workers returning to South Africa and renewing their contracts with TEBA. Interviews included a mini-survey (a data collection tool developed by the Partnership in Health and Mobility in East and Southern Africa for use across the whole SADC region), open-ended questions, and an opportunity for open-ended suggestions and informal “stories.” Interviews were carried out in a private room in Portuguese or Changana, whichever the interviewee was more comfortable with. The 30 returning miners interviewed in Ressano Garcia were randomly selected from those who expressed interest in participating. To conduct the interviews, six interviewers were trained for one day; IOM employees or consultants were present at all the interviews. Further informal interviews were carried out by a doctoral student.

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