What Multi-Level Solutions are Critical to Promote Zambian Mine Workers’ Health?

Promoting employee health has been well recognized by employers, as it contributes to the overall success of an organization, both in keeping employees healthy and productive and also in maintaining a higher level of employee retention. Employee medical services are particularly critical to employees in high-hazard industries, such as the mining industry. Yet, there is a lack of in-depth published research that considers the promotion of employee health from the perspective of employees. Research into the mining industry in Africa, with an emphasis on its employees, helps to fill this gap and identify various factors important to fostering the health of mining workers worldwide. For our study, we chose Konkola Copper Mines (KCM) in Zambia, Africa, surveying two hundred and eighty-five KCM employees and nine management staff in 2016. Our findings shed light on multi-level strategies beneficial for promoting the health of mining industry workers as well as workers in other industries, both locally and globally.

Keywords: Worksite health promotion, employee healthcare, social responsibility, African mining industry, Zambian mining workers

Introduction

Employee health is a multi-layered concern, impacted by a myriad of intertwined social, economic, cultural, political, and environmental influences, perspectives, and priorities. In light of ecological models, health promotion is most effective when these interwoven but often competing issues are targeted simultaneously. Yet, “multilevel interventions that better incorporate social, institutional, and policy approaches to health promotion have gone largely unheeded” (Golden and Earp 2012: 368). Over the past fifteen years, some newly formed, struggling mining companies in Zambia have been forced to reduce or even abandon social services and amenities, including company-run healthcare facilities for employees. Other mining healthcare facilities have undergone management buyouts, further reducing the direct commitment of their former mining company sponsors.

Among the many factors contributing to mining companies’ indifference toward continued operation of these healthcare facilities are the lack of interest of foreign investors in running health services; poor copper prices on the international market; and increasing costs, particularly operational costs, in the mining industry (World Factbook 2017, Hairong and Sautman 2013). Further, the Zambian mining industry faces challenges in maintaining an aging infrastructure, most notably in healthcare facilities, where demand for modernized equipment, facilities, and services are on the rise. In addition, retaining highly qualified health care professionals has posed a formidable financial challenge (Ministry of Health Zambia and EQUINET 2018, Nkombo and Abubakar 2002).

Employee medical services are critical to employees in high-hazard industries such as mining industry. Investment in employee health, employee satisfaction, and employee commitment/goodwill toward the
organization are appealing features in further attracting new employees in often-difficult labor markets (Hendriksen, et al. 2016). However, there is a lack of in-depth published research that considers employee healthcare issues in the Zambian mining industry from the perspective of employees. Based on the 2016 survey, our research fills this gap and investigates various factors that make the employee healthcare services important, not only to employees and prospective employees, but also to mining organizations. Our research provides the medical management team in KCM and teams in similar organizations with factors they need to consider when implementing improvements and when evaluating which multi-level strategies most effectively promote workers’ health.

**Literature Review**

*Mining Safety and Health*

The Zambian mining sector can improve miners’ safety and health by treating operational risk management as a full-fledged function within their organizations, while benchmarking advanced operational control methods (Muchemwa, et al. 2017). This coordinated approach requires senior management commitment to administer safety management programs efficiently and effectively. To mitigate hazards and the concomitant risk, mining company management should increase employee participation in risk management activities and improve safety training practices (Muchemwa, et al. 2017). Various intervention measures can improve workers’ safety and health. A specific targeted intervention method, however, seems to be more effective in reducing coal mining accidents (Tong, et al. 2019).

Drawing on an array of historical evidence, Walters and Quinlan (2019) point out that a resistance-model of mobilization can help explain coal miners’ motivations for seeking voices on occupational health and safety [OHS] matters. Yet, as OHS system is bureaucratized, mineworkers lose voices on safety issues. Hence, Stewart, et al. (2019) propose a broader conceptualization of OHS, which enables the understanding of its environment in new, wide-ranging practical and political dimensions. In addition to an improved conceptualization of OHS, to protect workers and minimize worker injuries and deaths, mining companies must comprehend how best to comply with high OHS standards, what methodologies actually are working best in practice. A multi-faceted, multi-level health and safety climate survey tool can improve the understanding of OHS outcomes (Parker, et al. 2017).

To address a greatly elevated mortality rate for former miners in South Africa, Bloch, et al. (2018) call for coordinated, cooperative action involving the for-profit mining sector, governments and nonprofit organizations. Osewe (2015) proposes various forms of issue-focused partnerships to promote the mining sector’s adherence to higher health and
safety standards. By successfully leveraging these partnerships, researchers argue that the mining industry ultimately would gain, by employing healthier, more productive workers.

Employee Healthcare

The net gain for industrial employers from improved employee healthcare has been well documented. A study of a South African mining company with a high prevalence of HIV in its workforce revealed that the benefits from antiretroviral therapy programs far outweighed the costs, by reducing employees’ need to use company-sponsored healthcare and also by avoiding productivity losses due to worker illness, absenteeism, and turnover (Meyer-Rath, et al. 2015). Another benefit for industrial employers from providing health services for employees is that management ensures employees have ready access to more reliable healthcare, to earlier diagnosis, and to timely treatment, making it possible for employees to return to work earlier due to speedier recoveries (Ammendolia, et al. 2016, Reddick and Coggburn, 2007). Michaels and Greene (2013) stress that worksite wellness programs promote employee health, thus helping reduce direct and indirect health care costs.

Organizations have realized that by not investing in employee healthcare they are more prone to high indirect health costs such as absenteeism, sick days, and loss of qualified labor (Troy 2016). Affirming the cost-benefit analysis of other studies, a recent study by U.S companies disclosed that companies paid 200 to 300 percent more in the indirect costs of poor employee health than they expended in the direct costs of providing better employee health benefits (Porter, et al. 2008). Therefore, the clear empirical evidence shows that, despite the upfront and ongoing costs of improved employee healthcare, employers should prefer to maintain employee healthcare plans and/or increase benefits, rather than curtailing them or terminating them altogether.

Additionally, by directly providing healthcare or managing self-funded plans, an organization can increase savings over utilizing a third-party healthcare vendor. The savings stem from fewer administrative costs and better control over healthcare expenditures, while avoiding higher outsourcing fees. Moreover, organizations are empowered with an understanding of employee health patterns, enabling them to implement appropriate preventive and rehabilitative programs. Readily available healthcare information also leads to better understanding of employee healthcare costs; organizations may better control cash flows as healthcare payments are based on actual employee illnesses (Eyestone, et al. 2014; Self Insurance Institute of America 2009). As an additional benefit, employer-based health coverage protects employees from the financial exposure associated with high medical treatment costs or catastrophic health conditions (Blumberg, et al. 2012).
Health Interventions

Improving the quality of health care and service delivery adds value to organizations, as it facilitates better health outcomes for organizational investments (Parker, et al. 2017; HRET 2015). According to the systematic view of work organizations, employee health is closely tied to organizational effectiveness. Building a healthy organizational culture is critical to promoting organizational effectiveness and employee health (Di Fabio 2017, Grawitch and Ballard 2016, Sadia 2016). However, creating a culture of health takes passionate, persistent, and persuasive leadership. Effective leadership, healthy behavior, and spirituality achieve more positive results for employees and, ultimately, for their organizations (Son and South-Winter 2018; Dixon-Fyle, et al. 2012).

The moral hazard theory argues that when people bear a higher health cost burden, they more deliberately and drastically seek healthcare cost savings (Gould 2013). Also, multi-pronged organizational interventions should be aimed at promoting a culture of employee health and safety in multi-dimensional healthcare settings (Gray, et al. 2019; Tong, et al. 2019). Interventions that adequately embed multi-level worksite wellness programs can improve employee health and work performance (Hendriksen, et al. 2016; Bakker and Demerouti 2018). Another significant advantage of employer-based healthcare services is that they reflect positively on the organization’s image and social responsibility, not only by addressing employee healthcare needs but also by demonstrating a tangible commitment to the employees’ communities. Healthcare services can be a medium for building community trust and better stakeholder engagement, by demonstrating that organizations are developmental and social partners interested in enhancing the welfare of the communities that surround their operations (Murphy 2015). For this reason, mining companies should forge a long-term partnership with their communities and local health authorities to reduce the burden of disease and illness on those organizations (Osewe 2015). In addition, mining companies should realize that, by investing in public health in surrounding communities, they garner long-term benefits, such as sourcing healthy employees (Troy 2016; Ministry of Health Zambia and EQUINET 2018).

Methodology

We used the descriptive study design to address employer-based health services for mining workers (Prowle and Harradine 2015; HRET 2015). The survey study was conducted among KCM employees who were based in the towns of Chingola, Kitwe, and Chililabombwe in Zambia over a two-month period (i.e., from June to July, 2016). KCM had a workforce population of approximately 7,000 employees in 2016. The study targeted employees at all
levels, including senior KCM management (KCM grade 5 to 8) and general KCM employees (KCM grade 1 to 4).

Figure 1. Sampling Technique

Clustered stratified random sampling techniques were used to obtain a representative sample of the KCM employees, as illustrated in Figure 1, above. The clustering units were based on the IBU or geographical location of where the employees work from. Employees in the respective IBUs were further stratified based on their KCM grade by the proportion (%) of that grade in the entire KCM population and for that IBU. A sample size of 300 employees and 10 management staff in KCM were sampled to participate in the study based on calculations done from a sampling size table; 95% confidence level and a 5% margin of error and a population size of 7,000. Out of a sample of 300, a total of 285 employees were able to participate. Data was entered and analyzed for descriptive statistics using SPSS 20 and STAT13.

Results

Over 62% of the employees who participated in the survey were union workers (KCM 1 to 4). Most of these employees were 45 years of age or younger and had worked for six to 10 years for the organization. As Table 1 describes, below, a large proportion of respondents considered the following as the most important attributes of KCM medical services, based on the order of the highest combined rating of agreement (“agree” and “strongly agree”):

- staying healthy (90.6%),
- being productive (88.4%),
- maintaining the health of family members (88.4%), and
- assuring financial protection (85.9%).
Table 1. Factors Attributed to the Importance of Medical Services among Employees

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rating (%)</th>
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<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
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<tr>
<td>Provides financial protection</td>
<td>41.5</td>
</tr>
<tr>
<td>Contributes to family members staying healthy</td>
<td>37.8</td>
</tr>
<tr>
<td>Contributes to employees staying healthy</td>
<td>41.7</td>
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<tr>
<td>Helps employees remain productive</td>
<td>41.3</td>
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<tr>
<td>Employees choosing to stay or remain in employment with KCM</td>
<td>25.6</td>
</tr>
<tr>
<td>Contributes to employee morale and satisfaction</td>
<td>22.3</td>
</tr>
<tr>
<td>Health Services are easy to reach, utilize; there is no concern to seek other health services</td>
<td>16.8</td>
</tr>
<tr>
<td>KCM medical services are the most valued employee benefits</td>
<td>18.8</td>
</tr>
<tr>
<td>KCM medical services was an important factor in selecting KCM as an employer</td>
<td>13.9</td>
</tr>
<tr>
<td>KCM is better off financially by not providing employee medical services</td>
<td>3.5</td>
</tr>
<tr>
<td>KCM can perform better in terms of operations and production without the medical services</td>
<td>2.5</td>
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Contributions of the medical services to employee morale and satisfaction (69.2%) and selection of KCM as an employer based on KCM medical services (51.8%) were other factors respondents rated highly.
Management respondents highlighted the importance of the KCM company medical services to the KCM organization, as shown in Table 2.
Table 3. Importance of Medical Services to KCM as an Organization

<table>
<thead>
<tr>
<th>Factors Highlighted by Management Staff on the Importance of the Medical Services to KCM</th>
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<tr>
<td>1. Compliance with mining regulations: Contributes to the organization being compliant with mining regulations, e.g., First Aid, periodic health monitoring</td>
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<td>2. Source of revenue: By providing medical services to the community, other companies, and other mines, the department can generate revenue.</td>
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<tr>
<td>3. Reduces costs of employee medical expenses: Holistic/comprehensive medical services to employees and their dependents. Preventive health services to employees, dependants, and residents of communities in which KCM operates, contributing to a lower disease burden; thus, the organization substantially reduces ancillary health-related costs by offering these services.</td>
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<tr>
<td>4. Company cares about its workforce: By providing medical services, the company shows that it cares for its employees, who are an important, valued part of the organization.</td>
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<td>5. Improves productivity: The department helps keep employees healthy, which fosters significantly better employee workplace attendance and helps sustain higher levels of production.</td>
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<tr>
<td>6. Healthy Workforce: Through regular medical check-ups and screening, the company can detect employees’ chronic or developing medical conditions earlier, before they become more severe;</td>
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<tr>
<td>7. First Aid, Occupational Health, and Public Health sections of the medical services department: Crucial for the smooth running of mining operations, handling both urgent and routine medical issues, the department provides an advisory role to the company in setting policy and revising operations to cope with larger medical issues.</td>
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<tr>
<td>8. Reliable Access to medical services: Employees have access to quick, readily available, and reliable medical care, especially in mining injury cases and emergencies, which often present immediate, specialized, and especially demanding medical needs.</td>
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<tr>
<td>9. Corporate Social Responsibility: Enhance and promote corporate social responsibility activities, giving the company a better public profile and better esteem among employees, regulators, and the public alike.</td>
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</table>

As confirmed in Table 2, areas in which all management respondents indicated agreement (“agree” or “strongly agree”) that company-sponsored medical services were important included providing financial protection, organizational success and performance, employees staying healthy, and employee productivity (all at the top of the Table), as well as KCM’s corporate image and social responsibility (near the bottom of the Table). Management respondents also rated highly the following factors, based on the order of the highest combined rating of agreement (“agree” and “strongly agree”): more cost effective by directly providing medical services (89.0%), reducing employee absenteeism (78.0%), and medical services being the
most valued employee services (78.0%). Management respondents gave similar responses to those of employees that, without medical services to employees, the KCM organization will not perform better financially or logistically, in its operations and production.

<table>
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<tr>
<th>Table 4. Employee Satisfaction of Medical Services</th>
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<tr>
<td><strong>Rating (N)</strong></td>
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<tr>
<td><strong>KCM Grade</strong></td>
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<tr>
<td>KCM1</td>
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<td>KCM2</td>
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<td>KCM3</td>
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<tr>
<td>KCM4</td>
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<tr>
<td>KCM5</td>
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<td>KCM6</td>
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<tr>
<td>KCM7</td>
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<tr>
<td>KCM8</td>
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<tr>
<td>% of Total</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Male</td>
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<tr>
<td>Female</td>
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<td><strong>IBU</strong></td>
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<td>Nchanga</td>
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<td>Konkola</td>
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<td>Nchanga Smelter</td>
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<td>Nkana</td>
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<tr>
<td>Corporate</td>
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<tr>
<td><strong>Management ratings</strong></td>
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<tr>
<td>on employee satisfaction with medical services</td>
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</tbody>
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Management respondents provided further insight as to why they believed medical services were important to the KCM organization, from legal, financial, and organizational perspectives, set forth in Table 3. By providing medical services to employees, KCM not only meets its legal and social responsibilities, but also gains multi-level financial benefits through increased productivity, reduced medical expenses, and additional generated revenues. Despite the obvious importance and value of employee health services, employee satisfaction levels with the services were disappointingly low. Only forty-four percent of the employees surveyed rated the medical services delivered as “Average”, as noted in Table 4. This satisfaction level was notable across the various categories of employees,
gender, and IBUs – except for corporate/management employees who were more inclined to rate their satisfaction as “Good” or “Very Good.”

Table 5. Management Responses on Changes Required to Sustain the KCM Medical Services

| Changes that can Contribute to the Sustainability of the KCM Medical Services |
|---|---|---|---|---|
| **Address Inefficiencies** | **Employee Contributions** | **Healthcare Human Resource Investment** | **Fresh Re-investment** | **Commercialization** |
| Procurement processes | Introduce a policy for employees to contribute to medical services | Invest in the training of healthcare workers (HCWs) | Investment in modern medical equipment, diagnostic equipment and infrastructure | Financial and commercial autonomy |
| Eliminate wastage and leakages of resources in the department | Address retention of healthcare workers | | | Re-branding and enhanced marketing of the services |
| Billing | Recruitment of healthcare workers | | | Partnerships with other organisations |
| Reduce waiting time | Address motivation, recognition and conditions of service of HCWs | | | Expansion of the scope of services |
| Service delivery | | | | |
| Maintenance of infrastructure | | | | |

As displayed in Table 5, investing in healthcare workers in the medical department at KCM is critical – both to improve the service quality and also to enhance the sustainability of KCM’s medical services program.

Management respondents offered diverse suggestions on what changes would be required to help the medical department become more self-sustainable. These respondents addressed the medical services department’s inefficiencies, the introduction of employee contributions, an investment in human resources, a fresh re-investment in medical equipment, and a need for commercialization and new partnerships. An additional suggestion was that KCM needed to finance its medical services program based on a recommended per capita healthcare funding standard, which should encompass employees, dependents, retired employees with their dependents, and former miners entitled to medical services for life due to work-related injuries.
Discussion

This study confirmed that medical services are vitally important both to KCM as an organization and to its employees. Significant factors revealed during the study – such as, employee financial protection, employee health and productivity, employee retention, and employee morale – are the same factors identified in literature (Willmer, et al. 2018; Troy 2016; Conference Board of Canada 2014), factors that also are noted as contributing to the organization’s overall success. As revealed in this present study, financial protection is a key benefit of employee health services, serving to reduce the risk of runaway expense from a catastrophic health event or condition, known to lead to impoverishment among employees (Koyi 2019). By minimizing employee concerns in seeking healthcare services for their families and for themselves, the organization can again increase productivity by allowing employees to focus on their work, another substantial collateral benefit for the organization (Ammendolia, et al. 2016; Meyer-Rath, et al. 2015; Chuma, et al., 2013). Further, organizations have come to realize that by failing to invest in employee healthcare, they become liable to bear many indirect, less obvious costs arising from poor employee health (Troy 2016; Eyestone, et al. 2014; Porter, et al. 2008). Our study’s parallel results corroborated that, despite the upfront costs, investment in employee healthcare is more cost-effective overall for an organization such as KCM.

It is interesting to note that, despite the employee health services being vitally important, employee satisfaction levels with those in-house services rated only average, at best. This lack of satisfaction may have several root causes, but two reparable ones are obvious. First, the employee dissatisfaction may reflect that the delivery of medical services is below employee expectations, particularly in comparison to the delivery by private providers. Second, the employee dissatisfaction may reflect inefficiencies in medical service delivery, caused at least in part by budgetary constraints/inadequate funding.

Accordingly, because mining company budgets are increasingly stretched, KCM needs to focus on value in healthcare service delivery, to improve employee satisfaction of medical services. More needs to be done to raise employee satisfaction levels by having healthcare professionals examine the existing structure, to locate and remove inefficiencies, increasing the quality of the services provided, while still using the department’s existing resources. KCM should consider better scheduling for the medical service department, to make service delivery more convenient for employees. KCM also should consider a reallocation of funds, to direct more monies to those healthcare needs/services that employees need and value most.

Regardless of the methodology for improvement, better health outcomes and improved efficiency are key components in lowering healthcare costs. Obtaining better value from the existing funds, rather than simply slashing the budget or adopting harsh and impracticable cost-
reduction initiatives, likely will be more successful (Conference Board of Canada 2014; WHO 2010).

In addition, purposeful expansion of the certain aspects of medical service delivery may come even with company cost-cutting, by broadening funding sources beyond company resources. An effort to attract commercial healthcare and/or pharmaceutical co-branding could expand the budgets; reduce costs to the company, employees, and their families; co-sponsor and/or introduce new and existing needed services; and increase program goodwill, raising employee satisfaction levels overall.

In terms of managing its most important asset – the workforce – an organization benefits from providing healthcare services to employees, including through the retention of able, trained, healthy employees, as our study reveals. Both from a financial and an operational perspective, organizations perform better by investing in employee health services. But, sustaining those medical services requires addressing inefficiencies, re-investing in healthcare workers and equipment, and obtaining employee buy-ins, including through financial contributions.

Earmarking employee contributions is an innovative way of sourcing healthcare financing. For an organization such as KCM to undertake this model healthcare financing, there needs considerable trust among employer, union leaders, and employees alike, so that funds, once collected, are properly utilized for their intended healthcare service purpose. Skillful bargaining, proper documentation, and thorough program oversight are necessary to secure cooperation from unions, a critical component in successfully implementing and maintaining mandatory employee contributions to fund company healthcare. Unions have a powerful, influential role when it comes to addressing employee health benefits (Thornton 2017; Chuma, et al. 2013; WHO 2013). In fact, as management respondents recognized, without union endorsement and validation, novel, substantial new employee policies either will fail to be implemented or will wither a short time after implementation. Accordingly, this distinctive form of financing for company healthcare services requires an on-going, trust-based company engagement with employee unions and their leadership.

Conclusion

Organizations such as KCM are making an important investment in their employees and businesses by providing company-sponsored healthcare services. Findings from numerous observations and studies, including ours, shed light on the close associations between organizational and financial investment in employee healthcare services and employee satisfaction. Moreover, consistent data supports the benefits of multi-level strategies for promoting the worker health, particularly in demanding industries such as mining. Organizations should promote employee health through a culture of health and complementary activities, including wellness programs, disease
management programs, and screening and prevention programs for chronic
diseases. Implementing these activities and human behavior-based strategies
helps establish and encourage a culture of health among workers,
empowering employees to be more cognizant of and engaged in their health
and lifestyle decisions. In turn, this implementation offers employers direct
and indirect benefits, such as healthier employees with fewer health
complications, reduced numbers of employee hospital admissions, and lower
future healthcare costs overall (Son and South-Winter 2018; Haas, et al.
2016).

Many Sub-Saharan African countries are increasingly seeking to impose
lower out-of-pocket payments for workers, while striving towards domestic
mandatory prepayment financing within contributory health insurance
schemes (McIntyre, et al. 2018). The WHO (2010) recommends that
organizations should be encouraged to utilize pre-payment models, because
they are more efficient and equitable. Various models have been developed
in which a proportion of contributions towards life insurance and retirement
plans are put aside as savings, accruing interest over time and generating a
fund that can finance both current healthcare needs and retirement
healthcare costs (National Insurance Services of Wisconsin 2012). KCM
may explore and analyze these models to develop a stable system of
healthcare financing for its retirees and ex-miners, who currently have a
five-year access to free healthcare (Muchemwa, et al. 2017). Our research
suggests implementing pre-payment employee medical plans as a viable
funding option.

However, more needs to be done to raise the levels of employee
satisfaction with the medical services. Organizations should consider
follow-up studies of both employee satisfaction and management
satisfaction with the company medical services program and with the
medical services actually being delivered by that program. These studies can
work not merely as a ratings system, but, far more importantly, can work to
provide data for a realistic snapshot evaluation of the efficacy of the system,
of the appropriateness of its overall funding levels, and of the proper
distribution of those funds within the system. With these studies at regular
intervals, the organization can more thoroughly evaluate the system to
determine its effectiveness, can consider whether alternatives would be more
efficacious, and can adapt the system to meet the changing needs of the
workforce.

Despite privatization of the Zambian mining industry over twenty years
ago, there remains relatively limited information on its employee healthcare
services, suggesting that further studies would be instructive. While the
results of a study, such as ours, of a single mining company in Zambia
seems to provide mostly anecdotal data, more general principles – principles
that can apply to the entire mining industry and to other industries as well –
emerge, particularly when we consider seemingly anecdotal data in the
context of other studies, both of the mining industry and other industries.
Over time, the similar findings of these different studies have confirmed
some startlingly consistent results, suggesting certain beneficial industry-wide – and perhaps global – changes in the delivery of healthcare services to employees and their families.

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