International Commission on Occupational Health - ICOH
Commission Internationale de la Santé au Travail - CIST
Founded in 1906 as Permanent Commission

ICOH Statement on Preventing TB among Health Workers April 28, 2018

Preventing TB among Health Workers through Strengthening Occupational Safety and Health Systems and Services

The International Commission on Occupational Health (ICOH) calls for a concerted global effort to promote Occupational Safety and Health (OSH) strategies to prevent Tuberculosis (TB) in high-risk TB occupations such as work in the health sector. This is consistent with the Moscow Declaration (WHO 2017a) and other international agreements (The 2030 Agenda; Stop TB Partnership 2015). ICOH encourages governments, ministers of health, ministers of labor, businesses, worker representative organizations, health workers professional associations and global health funders to invest in OSH measures to prevent new TB cases and to effectively and efficiently treat TB among health workers as well as health workers in training. The recent Ebola outbreak in West Africa, with the tragic loss of so many lives, including the lives of several hundred health workers (WHOa, 2015) has shown the need to protect health workers as much as possible from occupational infectious agents. The loss of life as well as the global repercussions are reminders of the importance of ready access to strong, responsive health systems inclusive of preventive OSH services for health workers in both high and low TB burden countries.

Health Workers and TB

The global incidence of TB at present is estimated to be 140 cases per 100 000 population. TB is the ninth leading cause of death worldwide, and the leading cause from a single infectious agent, ranking above HIV/AIDS (WHO, 2017b). Although the link between work in the health sector and TB was previously suspected, TB has been recognized as an occupational hazard in healthcare since the 1950s (Baussano et al, 2011). Health workers face an increased risk of contracting TB due to occupational exposure to TB bacilli in their work environment and in the communities where they live and work. (Baussano et al, 2011; Joshi et al., 2006; Uden et al., 2017). This is particularly true for health workers in high TB burden countries where they are reported to have a 2 to 3-fold higher incidence of active TB disease compared to the general population (Baussano et al, 2011; Grobler et al, 2016). Furthermore, the risk of hospitalization for multi-drug resistant TB among health workers in such settings has been found to be 5 times higher in health workers compared to that of non-health workers (O'Donnell et al., 2010). This risk is even greater for extremely drug resistant TB for which there are very limited treatment options and consequently higher associated mortality. The histories and testimonies of health workers who have survived occupational TB not only speak of the enormous challenges they had to overcome but also highlight the need for decisive mindset changes for greater prevention, for early accurate diagnosis and for improvements in the treatment of TB (von Delft, 2017; Sifumba, 2017; Xun Ting, 2017).

Many high TB burden countries, specifically those in Sub-Saharan Africa, also struggle with a very high prevalence of HIV infection, which confers a lifelong increased TB disease risk and poses a great challenge to TB control in these countries. Health workers in these countries exhibit similar rates of HIV infection as the population. Studies from South Africa

estimate HIV prevalence at 11-20% among health workers with greater prevalence of infection among younger women and community based health workers (Shisana et al., 2004; Claassens, 2013; Tudor et al., 2014; Adams et al., 2015; Grobler et al., 2016). In many countries, women comprise over 70% of the health workforce which make them indispensable to the delivery of health services (WHO 2017c). It is therefore necessary to have a gender inclusive approach towards all OSH and preventive interventions to ensure these are sustainable.

While health workers form the frontline response to combating the TB and HIV epidemics and servicing the health needs of populations, they themselves often do not have access to HIV and TB clinical services (ILO, 2010). This situation is compounded by a shortage of health workers in precisely those countries hardest hit by the dual epidemic. These are often also the countries with limited resources and the least support in the form of legal, institutional as well as trade union and health professional organizations.It has been estimated that the needs-based shortage of health workers globally is about 17.4 million (WHO, 2016). The high rates of TB among health workers have the potential to exacerbate this shortage and impact negatively on human resources in health.

Efforts for preventing occupationally acquired TB focus on the primary prevention triad of administrative controls, engineering controls and respiratory protection. This has been augmented by secondary prevention measures such as screening and treatment of both latent and active tuberculosis infection in health workers. In low resource settings, these measures are often poorly implemented, if at all, and efforts at infection control tend to be fragmented and poorly resourced (Tudor et al., 2013; Engelbrecht et al., 2016; Flick et al., 2017). There are challenges in applying preventative strategies in low resource, high TB burden settings, where most cases of occupational TB occur. These settings are characterised by large numbers of undiagnosed TB patients, limitations on staff, few infrastructural resources for triage and isolation, a lack of adequate ventilation and respirators and poorly maintained engineering controls, delays in diagnosis and treatment of patients, a lack of awareness and training as well as a lack of compliance, and a shortage of drug sensitivity testing. Secondary prevention is also limited by a lack of available occupational health expertise and the fears of staff regarding lack of confidentiality and job security. The paralyzing effect of TB stigma and discrimination, and in recent decades the close association of HIV and TB, present health workers with difficult challenges.

There is evidence that the implementation of preventive OSH and infection prevention and control (IPC) measures have the ability to reduce occupational TB risk in both low and high TB burden settings (O'Hara et al., 2017; Jones, 2017). However, much of this evidence is from high income low TB burden settings and more research is urgently needed in low income, high TB burden settings. Preventive measures include early diagnosis, isolation (where indicated), effective treatment, good ventilation as well as respiratory protection. However, the use of respiratory protection must be effectively implemented to result in real protection of health workers with the availability of a comprehensive fit-testing program. (Manganyi et al., 2017).

The labor force at greatest risk of contracting occupational TB are those health workers who are living with HIV or are immunosuppressed for other health reasons and those engaging in high risk occupational tasks leading to increased exposure to TB bacilli. Community health workers and those engaged in home-based care of TB patients are at

greater risk on account of high HIV prevalence, limited infection controls, inappropriate respirators and a lack of OSH training in many settings of community care.

In recent years, the increasing use of nanomaterials in the healthcare sector underlines the need to carry out additional research in order to assess the potential risk of a co-exposure of health workers to TB and nanomaterials (European Agency for Safety and Health at Work, 2015). Indeed, recently it has been observed that silver nanoparticles can modulate immune responses induced by infectious pathogens including TB. (Sarkar et al., 2015). Silver nanoparticles have anti-bacterial properties and are widely used in consumer and medical products and disinfectant sprays.

In light of evidence clearly showing an increased risk of TB among health workers, ICOH is calling for global action to protect health workers through improved implementation of effective OSH and IPC prevention measures in workplaces, and training of health workers themselves as well as hospital engineers, architects, procurement and maintenance staff. Also needed for these workers is access to occupational health services, appropriate respiratory protection programs, and strengthened health systems including primary, secondary and tertiary prevention. Protecting health workers is essential not only for their own health and well-being, but also for the effective functioning of the health system and by extension the health of the community at-large.

Recommendations:

To successfully implement international targets to end TB, ICOH encourages United Nations (UN) agencies, governments, global health funders, worker representatives, professional organizations, and all employers of health workers to facilitate increased funding and resources to protect health workers from TB by a comprehensive approach, including but not limited to:

A. Developing and implementing OSH and IPC workplace preventive practices and supporting policies, and strengthen prevention

- Develop, where necessary, or update existing national health workplace TB policies, and implement and monitor the policy at individual workplaces;
- Establish and implement TB IPC in healthcare settings in line with the WHO policy on TB infection control in health-care facilities, congregate settings and households (WHO, 2009);
- Implement efficient and effective OSH Information Systems to better gather reliable surveillance data on TB amongst health workers and to facilitate scientific research based on the data that can inform greater prevention;
- Develop, where necessary, and implement OSH laws and regulations that will protect health workers from exposure to TB;
- Conduct occupational hazard identification and risk assessments in healthcare settings;
- Integrate TB prevention strategies for individual workplaces as a standing item on the agenda of statutory required OSH Committee Meetings;
- Support mandatory recording and notifying of TB among health workers as well as its addition to the national list of occupational diseases;
- Conduct regular TB IPC assessments (O'Hara et al., 2017);

- Facilitate the availability of a dedicated workplace TB officer (Godfrey, 2016) who ideally should be responsible for coordinating all TB prevention in the particular workplace, in collaboration with OSH and IPC professionals and the OSH committee;
- Implement IPC guidelines to reduce nosocomial exposure and transmission of TB and promote the rapid identification, triage, and isolation of potentially infectious patients, the maintenance and improvement of engineering controls, and the availability of respiratory protective equipment. (Maloney et al., 1995; da Costa et al.; 2009);
- Strengthen communication with health facility management and their involvement during design, construction or renovations of building infrastructure to ensure optimal ventilation for TB prevention;
- Review and where indicated, improve conditions of work of health workers including hours of work and remuneration.

B. Training and Awareness Raising

- Share existing successful TB education and training programs or develop new TB education and training programs for all health workers and line managers on workplace TB practices, policies and implementation, especially in high-burden countries so as to create a comprehensive preventive OSH culture in workplaces;
- Encourage funding for development and maintenance of an Occupational Healthcare Worker TB Prevention Data Repository that will provide links (free to all) to all public domain successful practices, policies and training;
- Share existing successful training programs or develop new training programs for the Labor Inspectorate on inspection and monitoring of occupational TB programs for health workers;
- Consider innovative approaches, including arts-based methods, to convey messages about the risks and need for protection, address stigma and reduce non-disclosure (Parent S, 2017);
- Facilitate inclusive social dialogue between health workers and management to encourage a preventive OSH culture in the workplace;
- Encourage workplace public private partnerships (PPP) to help ensure promotion of effective and efficient workplace treatment programs for TB which will facilitate greater treatment access and will optimize workplace support for adherence to TB treatment programs.

C. Provision of occupational health services including access to TB and HIV care and support for health workers

- Be cognizant of the joint WHO ILO UNAIDS policy guidelines for improving health workers' access to HIV and TB prevention, treatment, care and support services (WHO, 2010a);
- Facilitate the urgent reporting and efficient compensation of occupational TB among health workers through the relevant insurance or social security systems;
- Ensure priority access for health workers for TB and HIV screening and treatment in line with international best practice in workplaces;
- Maintain the highest level of confidentiality and ethical practice when providing care and support to health workers;

- Prevent discrimination and stigmatization of health workers living with TB and HIV;
- Facilitate the involvement of health workers in TB health promotion programs;
- Facilitate risk based medical surveillance and access to confidential HIV counseling and testing and antiretroviral therapy (Lawn et al, 2010; Suthar et al., 2012; O'Hara et al., 2017; Verver et al., 2018);
- Facilitate reasonable work accommodation of health workers at increased risk of TB, such as those living with HIV, as well as health workers temporarily ill from TB or permanently impaired by TB or its treatment;
- Encourage trade union or professional health worker organization support through signed bilateral agreements on implementation of HIV and TB policies.

References

Adams S, Ehrlich R, Baatjies R, van Zyl-Smit RN, Said-Hartley Q, Dawson R, Dheda K. 2015. Incidence of occupational latent tuberculosis infection in South African healthcare workers. Eur Respir J 45(5): 1364-1373. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5523975/pdf/nihms862343.pdf

Baussano I, Nunn P, William B, Pivetta E, Bugiani M, Scano F. 2011. Tuberculosis among health care workers. *Emerg Infect Dis,* 17**,** 488-94. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.226.3547&rep=rep1&type=pdf

Claassens M, van Schalkwyk C, du Toit E, Roest E, Lombard C, Enarson D, et al. 2013. Tuberculosis in healthcare workers and infection control measures at primary healthcare facilities in South Africa. PLoS One. 8(10):e76272. http://catalogue.safaids.net/sites/default/files/publications/TB%20in%20Health%20Care%20Workers.pdf

da Costa P, Trajman A, Mello F, Goudinho S, Silva M, Garret D, et al. 2009. Administrative measures for preventing Mycobacterium tuberculosis infection among healthcare workers in a teaching hospital in Rio de Janeiro, Brazil. J Hosp Infect. 72(1):57-64. doi: 10.1016/j.jhin.2009.01.016. Epub 2009 Mar 17. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2737465/pdf/nihms112929.pdf

Daniel T. 2006. The history of tuberculosis. Respiratory Medicine. 100, 1862–1870. Available from: https://ac.els-cdn.com/S095461110600401X/1-s2.0-S095461110600401X-main.pdf?_tid=22594a8e-0a4e-11e8-90e00000aacb35e&acdnat=1517819313_533e19dcd3eeecedcf8199e772f1e3e6

Engelbrecht M, van Rensburg A, Kigozi G, van Rensburg H. 2016. Factors associated with good TB infection control practices among primary healthcare workers in the Free State Province, South Africa. BMC Infect Dis. 16(1):633. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5097379/pdf/12879_2016_Article_1984.pdf

European Agency for Safety and Health at Work, 2015) E-fact 73: Nanomaterials in the Healthcare Sector: Occupational Risks and Prevention. Available at http://osha.europa.eu/en/tools-and-publications/ publications/e-facts/e-fact-73nanomaterials-in-the-healthcare-sectoroccupational-risks-and-prevention/view)

Flick RJ, Munthali A, Simon K, Hosseinipour M, Kim MH, Mlauzi L, Kazembe PN, Ahmed S. 2017. Assessing infection control practices to protect health care workers and patients in Malawi from nosocomial transmission of Mycobacterium tuberculosis. PLoS One. 2017 Dec 6; 12(12): e0189140. doi: 10.1371/journal.pone.0189140. eCollection 2017.
https://pdfs.semanticscholar.org/6788/f02ccdcc7d5a8f5ff888f837cb5201a0a90e.pdf

Godfrey C, Tauscher G, Hunsberger S, Austin M, Scott L, Schouten JT, et al. 2016. A survey of tuberculosis infection control practices at the NIH/NIAID/DAIDS-supported clinical trial sites in low and middle income countries. BMC Infect Dis. 16:269. doi: 10.1186/s12879-016-1579-y.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4901412/pdf/12879_2016_Article_1579.pdf

Grobler L, Mehtar S, Dheda K, Adams S, Babatunde S, van der Walt M, Osman M. 2016. The epidemiology of tuberculosis in health care workers in South Africa: a systematic review. BMC Health Serv Res. 16:416.
https://www.researchgate.net/publication/306352094_The_epidemiology_of_tuberculosis_in_health_care_workers_in_South_Africa_A_systematic_review.

Horton R, Araujo E, Bhorat H, Bruysten S, Jacinto C, McPake B, et al. 2016 Final report of the expert group to the High-Level Commission on Health Employment and Economic Growth. WHO 2016: Geneva (Switzerland), WHO press.
http://apps.who.int/iris/bitstream/10665/250040/1/9789241511285-eng.pdf

ICOH 2017 International Commission on Occupational Health webpage. About ICOH
http://www.icohweb.org/site/about-icoh.asp

ICOH 2018 International Commission on Occupational Health. The triennial ICOH world occupational health congress. Dublin (Ireland), 2018 http://icoh2018.org/2018/

ILO 2010 International Labour Organization. Joint WHO-ILO-UNAIDS policy guidelines on improving health workers' access to HIV and TB prevention, treatment, care and support services: A guidance note. Geneva (Switzerland); ILO 2010.
http://natlex.ilo.ch/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_160904.pdf

Jones, RM. 2017. Burden of Occupationally Acquired Pulmonary Tuberculosis among Healthcare Workers in the USA: A Risk Analysis. Ann Work Expo Health. 61(2):141-151. https://academic.oup.com/annweh/article/61/2/141/2765104

Joshi R, Reingold AL, Menzies D, Pai M. 2006. Tuberculosis among health-care workers in low- and middle-income countries: a systematic review. *PLoS Med,* 3**,** e494.https://pdfs.semanticscholar.org/2afa/5db68aee53e86ca0daa2b52fd918b7805aed.pdf

Lawn SD, Wood R, De Cock KM, Kranzer K, Lewis JJ, Churchyard GJ. 2010. Antiretrovirals and isoniazid preventive therapy in the prevention of HIV-associated tuberculosis in settings with limited health-care resources. Lancet Infect Dis. 10:489±98. https://doi.org/10.1016/S1473-3099(10)70078-5 PMID: 20610331

https://ac.els-cdn.com/S1473309910700785/1-s2.0-S1473309910700785-main.pdf?_tid=4dc8f620-108d-11e8-9483-00000aab0f01&acdnat=1518506160_3b8365ef676fba8d5321b3ba0dbdbee5

Maloney S, Pearson M, Gordon M, Del Castillo R, Boyle J, Jarvis W. 1995. Efficacy of control measures in preventing nosocomial transmission of multidrug-resistant tuberculosis to patients and health care workers. Ann Intern Med. 122:90-5. PMID: 7993001 http://annals.org/aim/article-abstract/708354/efficacy-control-measures-preventing-nosocomial-transmission-multidrug-resistant-tuberculosis-patients

Manganyi J, Wilson SK, Rees D. 2017. Quantitative Respirator Fit, Face Sizes, and Determinants of Fit in South African Diagnostic Laboratory Respirator Users. Annals Of Work Exposures And Health. 61(9):1154-1162. https://doi.org/10.1093/annweh/wxx077 https://academic.oup.com/annweh/article-abstract/61/9/1154/4210021

O' Hara LM, Yassi A, Bryce A, Janse van Rensburg MC, Engelbrecht MC, Zungu M, Nophale LE AND Fizgerald JM .2017. Infection control and tuberculosis in health care workers:an assessment of 28 hospitals in South Africa. Int J Tuberc Lung Dis. 21(3): 320 - 326 http://dx.doi.org/10.5588/ijtld.16.0591

O'Donnnell MR, Jarand J, Loveday M, Padayatchi N, Zelnick J, Werner L, Naidoo K, Master I, Osburn G, Kvasnovsky C, Shean K, Pai M, van Der Walt M, Horsburgh CR, Dheda K. 2010. High incidence of hospital admissions with multidrug-resistant and extensively drug-resistant tuberculosis among South African health care workers. *Ann* Intern Med. 153**:** 516-22. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.690.7067&rep=rep1&type=pdf

Parent S, Ehrlich R, Baxter V, Kannemeyer N, Yassi A. Occupational health and TB: A feasibility study of participatory theatre with South African healthcare workers**.** *International Journal of TB and Lung Diseases*. 2017. 21(2): 140-148. **DOI:** https://doi.org/10.5588/ijtld.16.0399

Sarkar S, Leo BF, Carranza C, Chen S, Rivas-Santiago C, Porter AE, Ryan MP, Gow A, Chung KF, Tetley TD, Zhang JJ, Georgopoulos PG, Ohman-Strickland PA, Schwander S. Modulation of Human Macrophage Responses to Mycobacterium tuberculosis by Silver Nanoparticles of Different Size and Surface Modification. PLoS One. 2015 Nov 18; 10(11):e0143077) doi: 10.1371/journal.pone.0143077 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4651328/pdf/pone.0143077.pdf

Shisana O, Hall EJ, Maluleke R, Chauveau J, Schwabe C. 2004. HIV/AIDS prevalence among South African health workers. S Afr Med J. 94: 846-50. https://www.ajol.info/index.php/samj/article/download/13643/128086

Sifumba Z. 2017. Testimonial: TB Survivor and Activist http://www.tbproof.org/profile/zolelwa-sifumba/

The 2030 Agenda for Sustainable Development. Transforming our world. https://sustainabledevelopment.un.org/post2015/transformingourworld.

StopTB Partnership. The paradigm shift. Global plan to end TB 2016-2020 (2015). http://www.stoptb.org/assets/documents/global/plan/GlobalPlanToEndTB_TheParadigmShift_2016-2020_StopTBPartnership.pdf. Accessed Dec 2017.

Suthar A, Lawn S, del Amo J, Getahun H, Dye C, Sculier D, et al. 2012. Antiretroviral therapy for prevention of tuberculosis in adults with HIV: a systematic review and meta-analysis. PLoS Med. 9: e1001270±15. https://doi.org/10.1371/journal.pmed.1001270 PMID: 22911011 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3404110/pdf/pmed.1001270.pdf

Tudor, C, Van der Walt, M, Hill, M N, Farley, J E. 2013. Occupational health policies and practices related to tuberculosis in health care workers in KwaZulu-Natal, South Africa. Public Health Action. 3(2):141-5. doi: 10.5588/pha.12.0098. http://www.ingentaconnect.com/content/iuatld/pha/2013/00000003/00000002/art00013?crawler=true

Tudor C, Van der Walt M, Margot B, Dorman SE, Pan WK, Yenokyan G, Farley JE. 2014. Tuberculosis among health care workers in KwaZulu-Natal, South Africa: a retrospective cohort analysis. BMC Public Health: 14: 891. doi: 10.1186/1471-2458-14-891. https://www.researchgate.net/profile/Carrie_Tudor/publication/265165097_Tuberculosis_among_health_care_workers_in_KwaZuluNatal_South_Africa_A_retrospective_cohort_analysis/links/540ebf3f0cf2df04e756f2d8.pdf

Uden L, Barber E, Ford N, Cooke GS. 2017. Risk of Tuberculosis Infection and Disease for Health Care Workers: An Updated Meta-Analysis. Open Forum Infect Dis. 4**:** ofx137. https://academic.oup.com/ofid/article-pdf/4/3/ofx137/19638904/ofx137.pdf

Verver S, Kapata N, Simpungwe M, Kaminsa S, Mwale M, Mukwangole C, et al. 2018. Feasibility of district wide screening of health care workers for tuberculosis in Zambia. BMC Public Health:18:17. https://doi.org/10.1186/s12889-017-4578-z https://bmcpublichealth.biomedcentral.com/track/pdf/10.1186/s12889-017-4578-z?site=bmcpublichealth.biomedcentral.com

Von Delft D. 2017. Testimonial: Beyond the Numbers. http: //www.tbproof.org/who-we-are/our-team/dr-dalene-von-delft\

Wada M. 2007. Anti-tuberculosis chemotherapy. Kekkaku. 82 (10): 771 – 81. https://www.ncbi.nlm.nih.gov/pubmed/18018601

WHO. 2009. World Health Organization (WHO). 2009. WHO policy on TB infection control in health-care facilities, congregate settings and households. Geneva (Switzerland), WHO.2009. http://apps.who.int/iris/bitstream/10665/44148/1/9789241598323_eng.pdf

WHO. 2010. World Health Organization. Joint WHO/ILO policy guidelines on improving health worker access to prevention, treatment and care services for HIV and TB. Geneva (Switzerland). [Updated 2010; cited 2018 February 05]. http://apps.who.int/iris/bitstream/10665/44467/1/9789241500692_eng.pdf

WHO. 2015a. A preliminary report: Health worker Ebola infections in Guinea, Liberia and SierraLeone. Geneva (Switzerland). [Updated 2015; cited 2018 March 27]. http://www.who.int/hrh/documents/21may2015_web_final.pdf

WHO. 2015b.The End TB Strategy. http://www.who.int/tb/strategy/end-tb/en/

WHO. 2016. World Health Organization. Global strategy on human resources for health: workforce 2030. Geneva (Switzerland); WHO press. http://apps.who.int/iris/bitstream/10665/250368/1/9789241511131-eng.pdf

WHO. 2017a. World Health Organization. Moscow declaration to end TB: First WHO Ministerial Conference Ending TB in the Sustainable Development Era: A Multi-sectoral Response. Moscow, Russian Federation, 16-17 November 2017. http://www.who.int/conferences/tb-global-ministerial-conference/en/

WHO. 2017b. World Health Organization. Global Tuberculosis Report 2017. Geneva (Switzerland) http://www.who.int/tb/publications/global_report/gtbr2017_main_text.pdf

WHO. 2017c. World Health Organization. Women, decent jobs, economic growth: an opportunity to recalibrate investments in the global health and social workforce. Commentary, Campbell J. Director, WHO Health Workforce Department. July 2017. http://www.who.int/mediacentre/commentaries/women-jobs-economy/en/

Xun Ting, T 2017. Testimonial. TB survivor and activist. http://www.tbproof.org/who-we-are/our-team/dr-tiong-xun-ting/