

# 19

## BARRIERS TO AND INEQUITIES IN COVERAGE AND FINANCING OF HEALTH OF THE INFORMAL WORKERS IN INDIA

*Charu C. Garg\**

A healthy workforce is important for the productivity and economic development of a country. An improvement in the health of workers reduces worker absenteeism, loss of income and poverty. Not only does it help the workers themselves, but also their families. In several cases, it prevents the family from incurring catastrophic expenditures thereby averting their getting trapped in a downward spiral of poverty. The lack of prevention of occupational and work-related diseases and injuries causes an annual loss of about 4 per cent of the gross domestic product (GDP) from compensation due to sickness absence and reduced productivity. An estimated 2.02 million die from a wide range of work-related diseases and 160 million cases of non-fatal work-related diseases occur annually (ILO 2013).

Occupational safety and health (OSH) cover for the unorganised informal sector can be said to be non-existent in India. OSH currently focuses on formal workplaces, and not on where the majority of workers really work—on the streets, in shops, in their own homes or homes of employers, at garbage dumps, etc. OSH does not address the question of health of the workers in the context of their living and working in very poor conditions. With the informal

sector providing employment to over 80 per cent of the workers and about 50 per cent contribution to GDP (NCEUS 2008, Kolli 2011), the focus on health and safety of the workers in the informal sectors should be one of the prime responsibilities of the Government of India, especially under the discussion for universal health coverage (UHC). Traditionally, the focus of the OSH programme has been only on the health of the workers in the organised factories and mining, and more recently on safety at port and construction industry. The Twelfth Plan of the Planning Commission has recognised that the legislations for covering the workers in seven sectors—agriculture, construction, shops and establishments, *beedi* manufacturing, waste management, eating places, and home workers—that cover most of the unorganised labour force—are insufficient to cover the health of these workers. Further, for such a large workforce in the country not much statistics or studies are available for formulating coherent policies for providing effective healthcare (MoLE 2011).

Based on available literature, the first part of this chapter provides some evidence on healthcare coverage and financing available for these sections of the society.

---

\* The author is grateful to Mr Ivan Ivanov, Team Leader, Occupational Health Interventions for Healthy Environments, Department of Public Health and Environment, WHO, Geneva for initiating her in the area of Occupational Health and providing very useful inputs for this chapter. She would like to thank Dr Sambit Basu for his very useful comments on the first draft. Sumit Mazumdar, Sudheer Shukla and Nikita Mehra, of Institute for Human Development, Delhi, provided support on data and references. The author is solely responsible for any unintentional errors.

The second part of the chapter identifies problems in terms of demand and supply of health services to the informal sector workers. Based on recent systematic literature review (Garg et al. 2013), this chapter highlights the barriers to and inequities in access, availability, acceptability, affordability and effective coverage of workers for the entire continuum of care, including promotion, prevention, treatment and management of chronic respiratory diseases (CRD), one of the most common occupational health hazards (WHO 2013).

In the third section, we highlight the national and international policies for covering the health of the workers belonging to the informal sector. Based on the evidence from coverage, delivery of services and policies to cover the informal workers outlined in the three sections, the final section highlights the areas where the government needs to focus on strengthening the health of the informal sector workers.

## COVERAGE AND FINANCING OF HEALTH SERVICES FOR WORKERS

### Health Coverage for Workers

In India, as per 2012 estimates, there are roughly 487 million workers,<sup>1</sup> of which over 80 per cent are in the unorganised sector or households and are classified as informal workers (this excludes those in the unorganised sector with social security benefits provided by the employers).<sup>2</sup> Based on analysis of data in the employment and unemployment survey, 2011–12, of the 450 million usual status workers (based on usual activity in reference period of one year) in the age

group 15–64, only 19 per cent are in the formal non-agricultural employment and earn wages and salaries.<sup>3</sup>

The health of these regular wage earners in the formal sector is covered under the following programmes/schemes:

1. The Employee State Insurance Scheme (ESIS) scheme is applicable to all employees in the 'notified areas' and their dependents (children less than 25 years of age) from establishments with more than 10 employees who earn up to Rs 25,000.<sup>4</sup> While the ESI Corporation covered 72 million beneficiaries and 16.5 million employees in 2013,<sup>5</sup> there is a large number of eligible workers who are not covered under the ESIS due to its presence only in the notified areas with large concentration of employees. The scheme is financed through premiums collected from the employers and employees, and about one-eighth of the contribution comes from the state governments.
2. The Central Government Health Scheme (CGHS) is available to all central government employees (both working and retired), and their families. About 2 per cent of cardholders are from certain autonomous and semi-autonomous government organisations, Members of Parliament (MPs), and accredited journalists. Some of the state governments and public-sector undertakings also follow similar programmes. In 2012, the CGHS had health facilities in 25 cities with 250 allopathic dispensaries and 86 AYUSH (ayurveda, yoga and naturopathy, unani, siddha and homeopathy) dispensaries with 1,025,900 registered cards/families up from 866,687 (or 3 million beneficiaries) in 2009<sup>6</sup>. Employees contribute between Rs 50–500 per month, while the central government provides a major part of the funding for running the scheme.

<sup>1</sup> CIA Factsheet, <https://www.cia.gov/library/publications/the-world-factbook/geos/in.html>, accessed on 27 November 2013.

<sup>2</sup> The unorganised sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers. It includes *own account enterprises*, all unlicensed, self-employed or unregistered economic activity such as owner manned general stores, handicrafts and handloom workers, rural traders, farmers, forestry etc. (Jeemol Unni. and R. Naik, [http://wiego.org/sites/wiego.org/files/resources/files/Unni-labour\\_force\\_india.pdf](http://wiego.org/sites/wiego.org/files/resources/files/Unni-labour_force_india.pdf), accessed on 27 November 2013). Informal workers consist of those working in the unorganised sector or households, and the workers in the formal sector without any employment and social security benefits provided by the employers. Based on this, about 10 per cent of GDP is produced by the unorganised sector, but not by informal workers (Kannan et al. 2008). ILO defines informal employment as those with informal jobs (without employment relationship with the enterprise), whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period. (ILO 2004, <http://ilo.org/public/english/bureau/stat/download/papers/def.pdf>, accessed on 27 November 2013).

<sup>3</sup> Computed from Employment and Unemployment Survey, 68th Round, unit-level data, New Delhi: National Sample Survey Organization (NSSO).

<sup>4</sup> *The Hindu*, 2013. <http://www.thehindu.com/todays-paper/tp-national/tp-kerala/esic-income-ceiling-limit-increased-to-rs25000/article5644370.ece>, accessed on 10 June 2014.

<sup>5</sup> See <http://esic.nic.in/coverage.php>, accessed on 10 June 2014.

<sup>6</sup> See <http://cbhidghs.nic.in/writereaddata/mainlinkFile/Health%20Infrastructure-2012.pdf>, accessed on 24 February 2014.

3. Employees working in the private sector and earning more than the ESI wage limit or in certain semi-government organisations (e.g. universities), can be covered for their healthcare under: (a) accident and other health-related private insurance schemes, (b) medical reimbursement up to the stipulated upper limit for given conditions, (c) a medical grant or fixed sum payment to employees, or (d) firms/organisations having their own facilities. Often workers in organised plantations are covered by the 'employers own health facilities', and are legally covered by the Plantation Act.
4. Voluntary health insurance provided through four subsidiaries of General Insurance Corporation also covers several workers in the formal sector and some better-off workers (i.e. workers who are paid higher incomes and can afford voluntary health insurance and also have awareness about it) in the informal sector, who purchase these voluntarily. The voluntary health insurance programme typically serves only the better-off sections of the populations and mainly covers them for in-patient care. Although private health insurance has grown at the rate of 40 per cent per annum, but owing to high premiums, very low awareness, and poor backend infrastructure, it has not been able to cover a large part of the population (PHFI 2011).

India's landscape of coverage through government-sponsored health insurance schemes has undergone tremendous change since 2003. The eligibility criterion under the schemes varies, but the focus is on the rural areas and poor population, and sometimes on informal workers. Some important initiatives are:

1. Rashtriya Swasthya Bima Yojana (RSBY), launched in 2008, covers all the families across India who are recognised as below poverty line (BPL) in the state and central government lists. More recently, new groups such as porters, domestic workers, hawkers, construction workers have been included in this list. While the target population is 300 million individuals, it covered over 70 million beneficiaries in 25 states in 2011. The central government (75 per cent) and state government (25 per cent) provide the main finance for the scheme. Beneficiaries pay Rs 30 as registration fee.
2. Rajiv Aarogyasri Community (RAC) Health Insurance Scheme, launched in 2007 in Andhra Pradesh, covers all families with a BPL card and those with annual family income below Rs 75,000. In 2009–10, 85 per cent of the state's population or over 22 million families were covered. The state government provides 100 per cent funding for the scheme. These are likely to cover a large number of families with informal employment.
3. Chief Minister Kalaignar (CMK) Health Insurance Scheme was launched in 2009 in Tamil Nadu and covers the BPL families, i.e. those with an annual family income of less than Rs 72,000 and are members of 26 welfare boards. The scheme is entirely financed by the state government. In March 2011, the scheme covered 36 million individuals for mainly life-saving treatments.
4. Yeshasvini Co-operative Farmers Healthcare Scheme was launched in Karnataka in 2003, and covers all the members of the rural co-operative society in the state regardless of their poverty status. It covers over 3 million beneficiaries who contribute 58 per cent of the total sources of funds for the scheme. Rest of it is financed by the state government.
5. Vajapayee Arogyasri Scheme (VAS) was launched in 2009 in Karnataka to primarily cover tertiary care for BPL families across seven districts. It is entirely financed by the state government. In 2009–10, it covered over 1 million beneficiaries. The plan is to roll it to the entire state.
6. RSBY Plus Scheme was launched in 2010 to cover all RSBY beneficiaries of Himachal Pradesh. It is a top-up scheme to cover additional tertiary services, provide transport expenses and post-hospitalisation medical expenses. About a million individuals were covered in 2011. The scheme is fully financed by the state government completely.
7. Apka Swasthya Bima Yojna is a proposed scheme for Delhi and is similar to RSBY Plus scheme of Himachal Pradesh to cover the RSBY beneficiaries for top-up tertiary care insurance coverage up to Rs 150,000 per family per year.
8. Under the National Rural Health Scheme (NRHM) launched in 2005, and more recently the National Health Mission (NHM) launched in May 2013 to cover urban areas and non-communicable diseases (NCDs), there are several initiatives to cover women and children: Janani Suraksha Yojana (JSY) to reduce maternal mortality among pregnant women by encouraging them to deliver at government health facilities; Janani Shishu Suraksha Karyakarm (JSSK) to provide free and fro transport, free drugs, free diagnostic, free blood, free diet to pregnant women who come for

delivery in public health institutions and sick infants upto one year; Rashtriya Bal Swasthya Karyakram (RBSK) to screen diseases specific to childhood, developmental delays, disabilities, birth defects and deficiencies. The initiative will cover about 270 million children between 0–18 years of age and also provide free treatment including surgery for health problems diagnosed under this initiative; Mother and Child Health (MCH) Wings with additional beds; Free drugs and free diagnostic service to lower the out-of-pocket (OOP) expenditure on health; District Hospital and Knowledge Centre (DHKC) to provide multi-specialty healthcare including dialysis care, intensive cardiac care, cancer treatment, mental illness, emergency medical and trauma care; National Iron+ Initiative to look at iron deficiency anaemia in which beneficiaries will receive iron and folic acid supplementation. The focus of NHM is universal coverage, but most programmes currently are still for women and children and for general health. It is likely to lead to enhanced access and availability of essential healthcare services, but there are no specific programmes even for women to identify the problems caused due to occupational hazards especially in the informal sector. Women comprise 27 per cent of total work force and almost 30 per cent of total informal sector workforce.

Besides these, some community-based health insurance (CBHI) models to cover poor and informal communities through community-based organisations such as Self-Employed Women Association (SEWA), Karuna Trust, etc. also exist, although their reach, depth and scalability is limited at present, covering less than 1 per cent of the population, and these are mostly funded by the communities themselves.

Along with private health insurance, social insurance programmes and publicly-funded schemes, the number of people covered went up significantly from about 55 million in 2003–04, to 75 million people in 2007 to roughly about 302 million, almost a quarter of the population, in 2010. While the coverage of voluntary private health insurance increased from 24 million in 2007 to about 55 million in 2010, the coverage for ESIS and CGHS increased from about 50 million in 2007 to roughly around 58.3 million in 2010; the biggest increase came from three schemes—RSBY, Rajiv Aarogyasri and Kalaingar in a span of three years to cover roughly 185 million, or over one-fifth of India's population. The commitment to equity and access to poor people is clearly visible, especially in the case of Andhra Pradesh,

as health insurance covers over 87 per cent of the states' population and Tamil Nadu, where coverage is 62 per cent (Reddy et al. 2011). Further, of the 302 million people covered by 2010, more than 180 million of these were people below the poverty line. Given the trends, La Forgia and Nagpal (2012) report project that more than 630 million persons, or about half of the country's population, can be covered with health insurance by 2015 and spending through health insurance is also likely to reach 8.4 per cent of total health spending, up from 6.4 per cent in 2009–10.

Regarding the depth/extent of coverage, except the ESIS and CGHS that allows for comprehensive coverage including out-patient care, preventive/wellness care and hospitalisation, all the other schemes cover mostly chronic diseases and hospitalisation with limits on cash disbursed per unit (family or individual) covered per year and per procedure. The RSBY gives annual in-patient benefits of Rs 30,000 on a floater basis for a family of five, without any conditions on pre-existing diseases and also covers maternity care besides chronic diseases and in-patient care. RSBY Plus, CMK and RAC additionally cover tertiary care procedures, transport expenses, and post-hospitalisation medical expenses up to a maximum insurance coverage of Rs 100,000–175,000 per family. The commercial insurers normally do not provide out-patient coverage, chronic diseases, and excludes all pre-existing diseases even for in-patient care.

The health coverage for informal workers is a major cause of concern. There are no direct programmes for them. While some of the informal sector workers do get covered under RSBY or under the state-specific schemes, there are a large number of workers in the informal sector just above the poverty line who are vulnerable and likely to face impoverishment and catastrophic expenditures when they fall ill and are not covered under any scheme. We estimate this using Tables 19.1, 19.2 and 19.3 and Figure 19.1.

It is clear from Table 19.1 that 23 per cent of the total population is still below the poverty line and almost 49 per cent of the total population is in the marginal and vulnerable group. Those below the poverty line are likely to be covered by the RSBY or some state insurance programme. The marginal and vulnerable group also corresponds to workers in the informal sector. The distribution of informal sector workers by employment status shows that 80 per cent of the total workers are either self-employed or casual. Less than 2 per cent of the workers are regular employees in the informal sector,

TABLE 19.1 Percentage of India's Population and Per Capita Expenditures Per Day by Expenditure Class, 2004-05 and 2011-12<sup>7</sup>

Expenditure Class	2004-05	2011-12		2011-12		2011-12
	(R+U)	Rural (R)	Urban (U)	(R+U)	(R+U)	(R+U)
	(%)	%	Per capita per day (Rs)*	%	Per capita* per day (Rs)	(%)
a. Extremely Poor (up to 0.75 of Poverty line (PL))	6	10	<21	4	<25	8
b. Poor (0.75PL to PL)	15	16	21-27	14	25-33	15
c. Marginally Poor (PL to 1.25PL)	19	20	27-34	10	33-42	17
d. Vulnerable (1.25PL to 2PL)	36	34	34-54	30	42-67	33
e. Middle Income (2PL to 4PL)	19	16	54-109	32	67-133	21
f. High Income (>4PL)	4	4	>109	11	>133	6
g. Extremely Poor and Poor (a+b)	22	26	<27	18	<33	23
h. Marginal and Vulnerable (c+d)	55	54	27-54	39	33-67	49
i. Poor and Vulnerable (g+h)	77	80	< 54	57	< 67	73
j. Middle & High Income (e+f)	23	21	>54	43	> 67	27
k. Total/All Exp. classes	100	100	47.6	100	87.7	100

Notes: \* For total/All Exp Classes, the average expenditure is given. PL: Poverty Line.

Sources: 2004-05 data is from Report on Conditions of Work and Promotion of Livelihoods in the unorganised sector, NCEUS, MoLE (2009) quoted in Reddy et. al. (2011); 2011-12 are author's calculations based on information in NSS 68th Round consumer expenditure survey, MoSPI (2013).

TABLE 19.2 Percentage of Total Formal and Informal Employment by Usual Status in (Rural + Urban) Areas (15-64 years), 2011-12, India

Employment status	Self-employed	Regular	Casual	All
Formal waged and salaried	0.0	19	0	19
Informal Non-Agriculture	20.2	0.8	13.5	34.5
Informal agriculture	29.6	0.6	16.2	46.5
Total	49.9	20.4	29.8	100.0

Source: Computed from Employment and Unemployment Survey, 68th Round, unit-level data, NSSO.

TABLE 19.3 Percentage of All Non-agricultural Workers (Usual Principle Status &amp; Subsidiary Status) by Location of Work (Rural + Urban), 15-64 years, 2011-12

Location of work	% in non-agriculture
No fixed place	5.2
Own dwelling	10.6
Own enterprises/unit/shop	18.4
Employer's dwelling	3.8
Employer's enterprises/unit/shop	40.1
Street with fixed location	2.3
Construction site	14.8
Others	4.8
Total - (239.1 million)	100

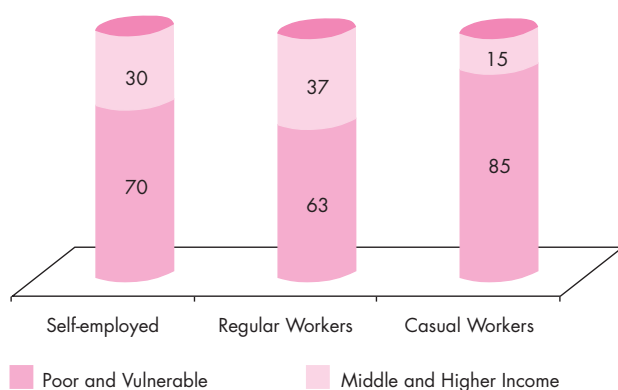
Source: Computed from Employment and Unemployment Survey, 68th Round, unit-level data, NSSO.

whereas all employees in the formal category are regular waged employees (Table 19.2).

The distribution of workforce by expenditure class is shown in Figure 19.1. Informal sector workers, mostly self-employed (50 per cent) and casual (30 per cent), fall in marginal and vulnerable group (60 per cent), and only 20 per cent of these will be in higher income groups. Two-thirds of regular employees are either in higher income category or even if vulnerable, they are likely to be covered either by some form of health insurance scheme such as the ESIS or CGHS. There is insufficient health insurance coverage for informal workers except RSBY and some state insurance schemes more recently, and as public sector is still characterised by well-known deficiencies such

<sup>7</sup> The per capita expenditure per day is upper limits for specific expenditure class and average for all expenditure classes. Poverty line (PL) is monthly expenditures below Rs 816 in the rural areas and Rs 1,000 in the urban areas for 2011-12 (Government of India 2013).

FIGURE 19.1 Distribution of Workforce Categories by Expenditure Class, 2011–12



Source: Modified from NCEUS, Ministry of Labour and Employment, 2009. Quoted in Reddy et al. (2011). Adjusted for decline in the proportion of poor and vulnerable from 77 per cent in 2004–05 to 73 per cent in 2011–12 as shown in Table 19.1.

as access and quality, they rely on private sector and pay out of pocket.

In terms of the location of work for non-agriculture sector informal workers, we find that almost 55 per cent of them work in employers units or at construction sites (see Table 19.3). Many employers, in order to avoid paying for their employees keep the size of their enterprise below 10 workers (and many a times even use casual workers). For employers keeping 10 or fewer workers or at construction sites, schemes such as ESI could be expanded to cover them with specific interventions. For those with no fixed location or working on their own or in employers' dwellings, it is hoped that the RSBY will become more inclusive and will cater to their needs.

It is clear from the above, that while the health insurance coverage has increased significantly over the last 5 years to cover about a quarter of India's population, there is still a large proportion of the informal population that do not have any form of coverage and even those who are covered, the depth of coverage is still very low and a large proportion of people are still spending a large amount of money out of their pocket. Further, the effective coverage for informal workers is even worse as there is dearth of programmes for risk assessment at workplaces, and screening for any high risk conditions. They often do not seek timely treatment as they are either unaware of their diseases acquired from poor working conditions or find the opportunity costs of

seeking treatment as very high as many of these workers are daily wagers. In a study on sustainable livelihood for unorganised workers in Delhi-NCR, work conditions were often found to be poor with workers facing several health challenges. OSH awareness among the informal workers and employers and was found to be very low (Kumar et al. 2012).

## Financing of Health Services for Workers

India spent 4 per cent of their GDP on healthcare, with 58 per cent of total health expenditures still financed through OOP in 2012.<sup>8</sup> The increased public expenditures under state government health insurance programmes and NHM seems to have helped in reducing the OOP expenditures from 72 per cent in 2004 (MoHW 2009) to 58 per cent in 2012.<sup>9</sup> In spite of the declining proportion of OOP expenditures in total health expenditures, there are a large number of families that still incur catastrophic health expenditures and fall below the poverty line due to direct healthcare payments. In fact, the percentage share of consumer expenditure towards medical care has increased from 5.7 per cent to 6.9 per cent in the rural areas and from 5 per cent to 5.5 per cent in the urban areas between 2009–10 and 2011–12 (MoSPI 2013). Even though the per capita expenditure on medical care is higher in urban areas at Rs 146 as compared to Rs 95 in the rural areas, the burden on rural households is higher (ibid.). At the two ends of income distribution—those in the poorest income quintile and those in 4th and 5th income quintiles, there is some form of health security, but for those above the poverty line in marginal and vulnerable groups and mostly informal workers, there is almost no financial risk protection. Most recent studies show that in the 2nd and 3rd income quintiles, the largest percentage of population falls below the poverty line due to OOP payments (Van Doorslaer et al. 2006, Garg and Karan 2009, Selvaraj and Karan 2009, Berman et al. 2010, Selvaraj and Karan 2009, 2012). Also, these studies show a large percentage of people (mostly hovering just above the poverty line) fall below poverty line due to health expenditures on outpatient care and expenditure on drugs. In rural areas, 10 per cent of households in the 3rd quintile fall below the poverty line due to OOP payments, out of which 8

<sup>8</sup> WHO NHA database, [www.who.int/nha/country/ind/en/](http://www.who.int/nha/country/ind/en/), accessed on 31 March 2014.

<sup>9</sup> Ibid.

per cent are due to expenditures on out-patient care and drugs. In urban areas, the peak is at 2nd quintile with almost 12 percent of urban households fall BPL due to healthcare expenditure and again over 8 per cent are due to expenditures on out-patient treatment and drugs (Berman et al. 2010). This implies that those who are in vulnerable and marginal income categories (2nd and 3rd income quintile) are more likely to fall below the poverty line due to large expenditures on drugs and out-patient care. Workers in the informal sector fall mainly in the 2nd, 3rd or 4th income quintiles. They do not have sufficient coverage from any health insurance or tax-based government programmes, and even though some may rely on government provided system for in-patient care, almost all rely on OOP payments for out-patient treatment and drugs.

Recent evidence on the impact of publicly-financed health insurance schemes—RSBY and other state government-based schemes failed to provide financial risk protection, demonstrating that the poorer sections of households in intervention districts of the RSBY, Rajiv Aarogyasri of Andhra Pradesh, and Tamil Nadu Health Insurance schemes experienced a rise in real per capita healthcare expenditure, particularly on hospitalisation, and an increase in catastrophic headcount<sup>10</sup> (Selvaraj and Karan 2012). While there is still some debate on the methodology and results of the study, it is clear, most of these public-funded insurance programmes are really the ‘disease-specific programmes’ and cover tertiary care and are not really ‘healthcare programmes’ that can prevent the workers to fall very ill, avoid injuries or provide cover to them for out-patient treatment and drugs.

Interventions under NRHM have gone a long way in terms of utilisation of public facilities. Under the Janani Suraksha Yojana, where women are provided cash incentives for seeking care in public facilities, evidence from Odisha shows over 2.5 lakh beneficiaries have availed JSY benefits and Institutional delivery have increased by 25 per cent in the state in the last one year.<sup>11</sup>

Recent evidence needs to be analysed to see the impact of NRHM/NHM and state insurance policies for reducing catastrophic expenditures that push workers in the informal sector below the poverty line.

## DEMAND AND SUPPLY ISSUES FOR CARE SEEKING AND TREATMENT FOR OCCUPATIONAL DISEASES AMONG INFORMAL SECTOR WORKERS

This section identifies the problems in terms of the demand and supply of health services based on recent systematic literature review completed by the author and her team, on the barriers to and inequities in the treatment and management of NCDs (Garg et al. 2013). The most common occupational health problems are: injuries due to accidents, chronic respiratory/lung diseases (asthma, COPD [chronic obstructive pulmonary disease], pneumoconiosis, silicosis), musculo-skeletal disorders (such as low back pain), skin diseases (contact dermatitis), noise-induced hearing loss, poisonings especially due to pesticides, lung cancer, leukemia, certain infectious, parasitic and mental diseases. CRD is one of the most common occupational diseases<sup>12</sup> among workers (WHO 2013).

In India, 1.1 million persons die due to respiratory diseases every year of which almost a million are due to COPD (WHO 2011a). Age standardised death rates<sup>13</sup> are 178 per 100,000 among males and 126 per 100,000 among females (WHO 2011b). COPD is often considered an epidemic in India due to its huge burden. In 2010, 24 million adults aged 40+ suffered from COPD, and this number is expected to increase to 32 million by 2020 (Government of India 2011). The National Commission for Macroeconomics and Health has estimated the economic loss due to COPD in India to be around Rs 35,000 crores per annum. This is even higher than the total budget of the central Ministry

<sup>10</sup> Catastrophic headcount is the number of households incurring catastrophic health expenditures. Catastrophic health expenditures are incurred when direct payment for healthcare are greater than a certain percentage of the household incomes and forces them to cut on the necessities such as food, clothing, education, etc.

<sup>11</sup> Department of Health and Family Welfare, Government of Odisha, [http://203.193.146.66/hfw/NRHM\\_Achievements.asp?GL=7](http://203.193.146.66/hfw/NRHM_Achievements.asp?GL=7), accessed on 28 November 2013.

<sup>12</sup> Occupational diseases are diseases contracted as a result of an exposure to risk factors arising from work. Recognition of the occupational origin of a disease, at the individual level, requires the establishment of a causal relationship between the disease and the exposure of the worker to certain hazardous agents at the workplace. This relationship is normally established on the basis of clinical and pathological data, occupational history (anamnesis) and job analysis, identification and evaluation of occupational hazards as well as exposure verification (ILO 2013).

<sup>13</sup> A standardised death rate is a crude death rate that has been adjusted for differences in age composition between the region under study and a standard population.

of Health and Family Welfare (MoHFW) (Murthy and Sastry 2005, Salvi 2011, MoHFW 2005). The National Institute for Occupational Health (NIOH) study for 2004 shows the prevalence of occupational lung diseases varies from 15 per cent to 54 per cent in different industries (MoLE 2011).

The cause of CRD is often, smoking, unclean environment both at work and home, occupational hazards due to certain chemicals and gases and cooking fuels. Biomass fuels like kerosene, nitrogen dioxide from cooking gas in poorly ventilated kitchens, sulphur dioxide from industrial gases, and occupational exposure to cadmium, etc. all have serious implications in the causation of COPD (Rajan and Balakrishnan 2012). Occupational exposure to chemical toxins and silica dust is an important risk factor for COPD (WHO 2012). Occupational asthma and work exacerbated asthma results or is aggravated from agents that workers are exposed to at workplace. Almost 200 agents have been reported to cause these (Vijayan 2008).

### Demand-side Factors

Based on the analysis in terms of the availability, accessibility (physical and financial), acceptability, utilisation and coverage, applied on the continuum of care, the review finds that on the demand side the problems faced is that a large section of the informal sector workers forgo treatment (at least during the early stages) due to a poor knowledge of the disease symptoms, insignificant service availability at primary care level and opportunity cost associated with seeking treatment. Lack of adequate understanding and awareness among patients often delay in seeking treatment. COPD symptoms are either considered inconsequential or insignificant, to the extent that breathlessness is often ignored (Jindal 2012). On the other hand, many patients might hide their condition and do not seek treatment due to the stigma attached to the disease (Aggarwal et al. 2006). They present themselves only at late stages in tertiary care facilities when the cost of treatment becomes astronomical and they often break the continuity of treatment due to high costs associated at the terminal stages. The estimates per patient have enormously risen now with an escalation of costs of medicine, other treatment modalities and of hospitalisation. A large-scale study for Hyderabad shows that on an average a person with COPD spent Rs 23,300 for treatment in 1999 (Government of India 2011), much higher than the annual per capita income

(even in 2001, per capita income was only Rs 17,782 [Planning Commission 2014]). Hospitalisations actually amounts to almost 84 per cent of the direct costs associated with COPD in India (Salvi 2011). The high expenditures associated with treatment of NCDs often cause substantial impoverishment among patients (Garg and Evans 2011, Thakur et al. 2011). Further, high cost of rehabilitation and non-availability of treatment options for the poor and in the rural settings often leads to non-adherence (Gothi and Joshi 2011). However, issues related to impoverishing/catastrophic health expenditure of CRD, as well as inability to complete treatment (once initiated) due to costs are not well-researched, and require attention.

### Supply-side Factors

While there are general problems related to supply of services especially in the rural and remote areas, there are specific problems of lack of diagnosis or misdiagnosis for occupational diseases. Practitioners in India are often found facing difficulties in differentiating asthma from the rest of the respiratory illnesses, consequently leaving out a large burden of the disease untreated (Van Sickle 2005, Van Sickle and Singh 2008). Similarly, lack of understanding of COPD and its systematic consequence often results into poor satisfaction and treatment outcomes (Rajan and Balakrishnan 2012). Also, clinicians fail to collect information through an accurate history-taking and looking for the harmful exposures (e.g. from tobacco, wood smoke-chullahs, biomass fuels like kerosene, nitrogen dioxide from cooking gas, sulphur dioxide from industrial gases, or occupational exposure to cadmium, silica, asbestos, etc.), which bear tremendous importance in pathogenesis of CRD. Lack of appropriate advice on primary prevention through quitting smoking, reducing risk-factors, or non-recognition of occupational hazards is often observed. Physicians often lack the knowledge to separate the occupational diseases, which are often masked by other diseases.

Tackling COPD critically needs creating education and awareness among clinicians, e.g. about spirometry for early detection of disease. Effective communication on lifestyle modifications can inhibit further worsening of conditions (Salvi and Agrawal 2012). There is often a long time lag for the occupational diseases to become prominent. Special investigations in early stages to find the cause for the disease can go a long way, but this in turn requires better-trained staff at the first point of



contact for the patients. India hugely lacks clinicians specialised in Family Medicine (especially in the public sector), who can devise alternative treatment options that are financially sustainable and affordable for a majority of the poor patients at community level (Abraham 2012). Private physicians, who are often the first point of contact in the community for any ailments, are found to be influenced by patients' perceptions of respiratory disease severely loaded with stigma and ambiguity. Further, in fear of losing their patients, many of the private physicians are found compelled to prescribe only the most popular and widely accepted low cost therapies rather than more cost effective regimens such as inhalation therapies (Das and Hammer 2007). Existing evidences also support the fact that many patients in India seek consultation from pharmacists for advice and medication for treating symptoms, which may often lead to immediate relief but severe complications in the long run. Rehabilitative and promotive health services are often inadequate and need improvement, and alternative approaches. Pulmonary rehabilitation through exercises, nutrition and lifestyle managements recognised as an integral component of care provided to patients with moderate to severe COPD (Gothi and Joshi 2011).

The chronic and progressive nature of CRD makes it expensive and a difficult disease to treat. More cost-effective protocols need to be developed and executed by healthcare providers (Sharma and Singh 2011). Primary as well as secondary prevention becomes the key to cost-effective treatment and can reduce the growing burden of CRD. Primary prevention through education of managers and workers on safe work practices, awareness about permissible exposure levels and use of respirators and other personal protective equipment in specific occupations is required. Secondary prevention through effective diagnosis and treatment options requires involving sound, standard guidelines to associate risk factors with COPD, proper history-taking, patient-centric treatment with better patient communication, and awareness about disease worsening risks and prevent further complications like respiratory failure and hospitalisation. Rehabilitative services and encouraging home-based care through low-cost options can be a viable, long-term strategy to reduce effective disease burden. These interventions for improving the health of the workers at the primary care level can go a long way to reduce the incidence of disease and costs associated with treating them. The effectiveness of these prevention strategies, however, needs to be researched and documented.

## NATIONAL AND INTERNATIONAL POLICIES ON OCCUPATIONAL SAFETY AND HEALTH OF WORKERS

### National Policy on Workers' Health

In India, safety and health statutes for regulating OSH at work places exist only in respect of the four sectors namely, mining, factories, ports and construction. There are 16 Legislative Acts, which provides for OSH. The Factories Act, 1948 and the Mines Act, 1952 are two major legal provisions for covering work environment, safety and health of the workers. Amended Factories Act, 1987, allows for pre-employment and periodic medical examination and regular inspections of hazardous industries. The ESIS outlined above falls under the Factories Act. Further there are legal provisions for insecticides, dangerous machines, waste management, storage and import of hazardous chemicals, plantation sector, tobacco and *beedi* industry and electricity. All these are legislated by Directorate General Factory Advice Service & Labour Institutes (DGFASLI), which is an attached office of the Ministry of Labour & Employment (MoLE), Government of India, and serves as a technical arm to assist the ministry in formulation of national policies on OSH in factories and ports (MoLE 2011).

The acts above do not cover a vast majority of workers who work in the informal sector. Agriculture, still one of the largest employers of informal workers in India, is considered to be one of the most hazardous industries by the International Labour Organisation (ILO), but workers in this sector have no legal protection. Manufacturing and services sector employing less than 10 workers are not covered. Unorganised mines such as small stone crushers and agate workers often exposed to silica dust—an estimate shows almost 63 per cent incidence of silicosis among them—are not covered under any Act and do not benefit from any compensations available to workers in large mines (Gupta and Patel 2012). Many of the self-employed workers like rag-pickers, street vendors; shop-keepers, those working in home industries often suffer from respiratory diseases, intestinal problems, skin diseases and musculoskeletal problems. They are not covered by any legal requirements. Women working in informal sector face various hardships. Some non-governmental organisations (NGOs) e.g., SEWA have been providing them support for their rights and is trying to get their

CBHI programmes integrated with government health insurance programmes like RSBY, etc.<sup>14</sup>

There are several lacunae in implementation of OSH policies under various Acts for workers even in the formal sector (*ibid.*). These vary from non-coordination between different stakeholders responsible for implementation of laws; weak human resource chain with large number of vacant positions; no standard guideline for safe workplace; no regular surveys to measure workplace safety and work environment; poor reporting and inconsistent data from different organisations (Labour Bureau, DGFASLI and ESI corporation) on injury and disease incidents. The ESI Corporation, which works under the Factory Act, makes huge surplus every year, but shows serious lapses in terms of important OSH functions such as education of employees on occupational hazards, occupational surveillance teams, publication of data for monitoring or policy-making, availability of doctors, check-ups and monitoring of employees with chronic problems and several others.

Further, the extent of the problem for the workers' health is not yet fully identified, with poor surveillance system. The number of occupational injuries and deaths are grossly understated even for formal sectors. The DGFASLI reported only 1,509 fatal and 33,093 non-fatal injuries in 2009, using records from registered factories, which employed about 5 per cent of total workforce (Pringle 2012). The data on occupational diseases is even worse. Only 111 cases have been reported for Coal Worker's Pneumoconiosis since 1994 and 123 cases of silicosis since 1994. A large number of cases of silicosis remain undetected, undiagnosed, misdiagnosed and misreported (MoLE 2011). The ESI Corporation, which should have annual estimates of different diseases for workers covered by them, reported 1,576 cases of occupational diseases in 2010—a gross underestimate by any standards. For the informal sector besides a few random surveys, not much of statistics or studies are available for formulating coherent policies or action plan to cover the large informal workforce (Gupta and Patel 2012).

The Twelfth Five Year Plan has recognised that the Legislative Acts that cover most of the unorganised

labour force are insufficient to cover their health. Further, they recognise that not much statistics or studies are available for formulating coherent policies for effective healthcare for informal workers. Hence, the Working Group for the Planning Commission recommended measures for certain segments of the unorganised workforce (MoLE 2011):

1. OSH guidelines needs to be prepared based on the preventive self-management principle taking into account the uniqueness of their cultural contexts and the gender characteristics.
2. Training of agricultural workers in identifying and mitigating workplace hazards along with trainers' training programme.
3. Development of guidelines and trainers training programmes for non-agricultural workers.
4. Strengthening the role of NGOs, institutes, departments working in the field of unorganised sector for creating OSH awareness among the workers.
5. Conduct regular medical check-up for developing national level OSH database.
6. Formation of a board to deal with the national policy on occupational health and safety.

## International Policies to Strengthen the Health of Workers

The 60th World Health Assembly in 2007 and the WHO Global Plan of Action 2013–20 urges Member States:<sup>15,16</sup>

...to work towards full coverage of all workers, including those in the informal economy, small- and medium-sized enterprises, agriculture, and migrant and contractual workers, with essential interventions and basic occupational health services for primary prevention of occupational and work-related diseases and injuries... (Resolution WHA 60.26, 66.10). The focus is on primary prevention and work related diseases.

With the focus on UHC as one of the priorities for the period 2014–19 by WHO, access to services with

<sup>14</sup>Report of the National Workshop on Occupational Health of Women Workers in the Informal Economy, 4–5 April, New Delhi, India, <http://wiego.org/sites/wiego.org/files/reports/files/Andharia-SEWA-Report-2013.pdf>, accessed on 24 November 2013.

<sup>15</sup>Resolution WHA 60.26, 'Workers' Health: Global Plan of Action', [http://www.who.int/occupational\\_health/publications/global\\_plan/en/](http://www.who.int/occupational_health/publications/global_plan/en/) and [http://www.who.int/occupational\\_health/Declarwh.pdf?ua=1](http://www.who.int/occupational_health/Declarwh.pdf?ua=1), accessed on 18 November 2013.

<sup>16</sup>Resolution WHA 66.10, 'Follow-up to the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases', [http://apps.who.int/gb/ebwha/pdf\\_files/WHA66/A66\\_R10-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R10-en.pdf), accessed on 18 November 2013.

financial protection is needed to achieve good health (promotion, prevention, treatment and rehabilitation, including those that address health determinants) to guide development and to advance health equity in the coming years.<sup>17</sup> Convention 155, Article 21 of the ILO stipulates that occupational safety and health measures shall not involve any expenditure for the workers.<sup>18</sup> This is especially important in the context of informal sector workers who face financial hardships and are not covered under any social protection programmes. In working towards UHC, it is important to integrate certain essential occupational health interventions and services into the delivery of comprehensive and people-centred primary healthcare and provide all workers, especially those in the informal sector, agriculture, small and medium enterprises, migrant and contractual workers with access to people-centred health services that can respond effectively to their specific health needs and expectations. These include three groups of essential interventions at the primary care level: (1) advice for

improving working conditions and for promoting health at work; (2) early detection of occupational- and work-related diseases; and (3) support for return to work and preservation of working capacity. These provide protection against occupational diseases and injuries, maintaining their working capacity, workforce participation and income-earning potential, and empowering them to promote their physical and mental health and social well-being.<sup>19</sup>

Several countries have implemented different interventions and to different extent for managing workers' health at the primary care level (see Table 19.4). The level of intervention varies from one country to other, e.g. in Thailand 65 per cent of workers are covered with all non-treatment interventions listed below. It costs about \$30 per worker covered, with major costs being treatment costs. Less than \$1 is spent per worker targeted per year for covering them for non-treatment interventions listed below. Learning from their experience can allow for establishing goals

TABLE 19.4 Country Experiences at Implementing Essential Occupational Health Interventions at Primary Care Level

Interventions	Activities								
		Italy	Thailand	Columbia	Philippines	United Arab Emirates	Republic of South Africa	Islamic Republic of Iran	
Workplace visit	Walk through survey		+	+	+		+	+	
	Advice and recommendations		+	+	+			+	
	Risk communication/ health education		+	+	+			+	
Case management of occupational or work-related health problems	In-depth work history	+	+	+	+	+	+	+	
	Counselling	+	+	+	+	+		+	
	Contact with workplace	+	+	+	+	+		+	
	Notification/referral	+	+	+	+	+	+	+	
Preventive medical examinations and return-to-work	Treatment	+	+		+				
	Pre-placement	+			+	+		+	
	Periodic	+	+		+	+		+	
	Medical evaluation	+			+	+		+	
	Counselling	+			+			+	

Note: '+' represents that the intervention has been implemented at the country level.

Source: 'Global Development in Workers Health'—Presentation by I. Ivanov, Occupational Health Programme, WHO, March 2013 in South Africa. Based on studies conducted in countries on costing essential health interventions. Updated based on personal communication.

<sup>17</sup> Resolution WHA 66.1, 'Twelfth General Programme of Work, 2014–2019', [http://apps.who.int/gb/ebwha/pdf\\_files/WHA66/A66\\_R1-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R1-en.pdf), accessed on 24 February 2014.

<sup>18</sup> ILO, 'Convention 155', [http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_INSTRUMENT\\_ID:312300](http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312300), accessed on 24 February 2014.

<sup>19</sup> Connecting Health and Labour: What Role For Occupational Health In Primary Health Care?, Executive Summary of the WHO Global Conference, available at [http://www.who.int/occupational\\_health/publications/hague\\_executive\\_summary/en/](http://www.who.int/occupational_health/publications/hague_executive_summary/en/), accessed on 6 March 2014.

for scaling up health coverage of informal workers and for strengthening the capacities of health systems for achieving workers' health objectives.

## CHALLENGES AND OPPORTUNITIES TO TACKLE THE HEALTH OF INFORMAL WORKERS

### Challenges in Management of Health of Informal Workers

1. One of the major challenges for health of the workers in informal sector is that there are no effective government programmes to cover them for healthcare, even though they may suffer from higher risks due to workplace environment. A large proportion of these workers fall in the marginal and vulnerable expenditure category and are more likely to fall below the poverty line due to direct health care payments. With no legal protection in form of compensations, inadequate public delivery system at the primary care level, or health policies to cover them financially, workers continue working in the same environment (the area of work where they have the skills), get worse to an extent that their productivity reduces, and may even lose their jobs.
2. The health system is inadequate to prevent and manage occupational diseases. Besides infrastructure challenges especially in the rural areas, there is a lack of trained human resources to diagnose occupational diseases. Other diseases often mask them and sometimes the onset takes a long time. Providers lack knowledge and are not able to identify the cause in a timely manner. Workers are often treated like any other patients and the disease is misdiagnosed, does not get cured and tends to get worse, leading to higher costs of treatment.
3. It is often difficult to link the disease with the cause unless the health providers are aware of the work environment of their patients and know about the linkages of the diseases to the work environment. Appropriate tools to take work history and perform preliminary tests are often not available with primary care providers. Special investigations required for understanding the real cause are expensive, and often workers lack the finances for getting the tests done.
4. High workplace pollution and long and odd hours of work can be a severe cause of occupational diseases. The situation is further compounded by

over crowdedness and poor sanitary conditions. Employers often have exploitative tendency to cut costs and improve margins. Awareness among the workers about the workplace risks is missing and even if they know, the informal workers have poor bargaining abilities with their employers to demand better work environment without strict laws on these small establishments. There are serious lapses in implementation of OSH policies even for formal workers; hence any policies for informal workers will need to be strictly enforced.

5. There is a weak monitoring system to capture diseases linked to occupations, especially for those in informal sector. Primary healthcare is weak to diagnose occupational diseases and no surveillance system exists for reporting injuries and diseases, even when diagnosed. Poor availability of information on occupational diseases makes it difficult to make any coherent policies for workers health.
6. The fragmentation of policy and legislative framework to protect the health of the workers falls across several ministries—health, labour, mines, agriculture and industry. There is no effective co-ordination between these ministries.

### Implications for Policy

1. *Health security for informal workers needs to be improved.* About 60 per cent of non-agricultural informal workers work for employers (see Table 19.3). It should be made mandatory for the employers to ensure that their employees are covered under some form of health insurance scheme. The ESI coverage could be extended to these workers. RSBY and other state health insurance schemes covering only tertiary care need to cover expenditures on drugs and transportation. Geographical and population coverage for these schemes need to be expanded to cover informal workers that fall mainly in marginal and vulnerable categories. To reduce out-patient and drug costs, one of the major causes of impoverishment among households, subsidised primary care needs to be strengthened for prevention and early detection of diseases in order to reduce disease treatment costs.
2. *Supply side barriers to treatment need to be removed.* The MoHFW needs to come up with broad-based policy measures, aiming to reduce the barriers manifested in the entire continuum of care. For informal sector workers, a public health approach is required beyond the workplace for diagnosis, prevention

and promotion, and management of occupational diseases. This requires a multi-pronged strategy of improving infrastructure capacity and trained human resource availability at primary care level for screening, diagnosis, and effective referrals for informal workers. There is a need to have well-equipped public facilities particularly in areas where higher proportion of informal workers are at risk. Health providers need to be trained to diagnose if the health problems come from work or otherwise; in taking occupational history for sick workers; identifying the cause of illness early through appropriate tests; and managing the disease. The government and NGOs can support training for health providers to manage the disease effectively for improved quality of life, reduce patients' symptoms, prevent exacerbations and hospitalisations and even improve survival. Treatment costs need to be lowered by making essential drugs for treating occupational diseases available at a lower cost. Rehabilitation services for the poor and in rural settings require innovative approaches such as pulmonary rehabilitation focusing on breathing and lifestyle management for CRD, which can be a cost effective way to enhance the quality of life.

3. *Education and awareness can reduce demand-side barriers to seeking timely care.* Public health activists can play a role in reducing workplace hazards by making risk assessments at workplace and counselling both the employers and employees. Education and awareness about reducing workplace risks should be introduced even for the self-employed or those employed in the household sector (e.g. electricians, plumbers, painters, gardeners, etc.), agriculture, construction, etc. Private sector, NGOs, and media can support better communication for the workers in informal sector for identifying symptoms of occupational diseases and seeking timely care. The role of mobile technology can be explored to educate workers about the risks associated with different occupations and ways to identify symptoms linked to diseases arising out of the occupation. Further, implementation of the policy to use personal protective equipment by workers (such as use of masks and gloves to protect them from pesticides) needs to be improved.
4. *Safe work practices should be mandatory.* The MoLE needs to work with different government departments, such as agriculture, industry and most importantly with MoHFW to support programmes for preventive measures such as early screening at workplaces, education to reduce workplace risks,

etc. Health checklist and walk through surveys are important tools that can be developed to assess the workplace risks and making workers in different occupations aware about their surroundings and health. This will help workers to seek timely treatment to reduce the burden of the disease and economic costs associated with them. Education and inspection of employers on safe work practices should be mandatory in all informal set-ups to prevent employers to exploit workers and provide them with decent working conditions. Workers should be made aware of their rights through posters, pamphlets, etc. Simple messages targeting specific occupations can go a long way in preventing diseases and incurring large expenditures on cure.

5. *Low cost interventions at primary care level can be cost effective.* Primary and secondary prevention interventions found useful in other countries can be implemented taking the local context into account. These include workplace visits, risk communication, routine collection of data on past and current work, detailed occupational history for those with suspected occupational disease, counselling patients and managing their sickness and disability. Studies on cost effectiveness of these essential interventions are important for advocacy among the policy-makers in India. Quantifying the costs of this burden on health systems would allow for mobilising additional financial resources from other government departments and the private sector. In Thailand, WHO supported the government in determining the cost of primary and secondary prevention interventions at primary healthcare level and to provide evidence to include these as part of its national health insurance package.
6. *Surveillance and notification of occupational diseases need to be improved.* Better implementation is required for the ESIS, CGHS, medical facilities, and workplaces to provide data on occupational diseases. Notification of occupational diseases should be made mandatory. The next National Sample Survey (NSS) on health could collect more information on workers' health estimating both the disease burden and costs associated with them. Databases should be effectively used for making policies for informal workers.

The recommendations above along with the Working Group recommendations highlighted in the National Policy on Workers' Health section of this chapter should be implemented on a priority basis for all informal sector workers taking into account the

uniqueness of their occupations, cultural contexts and the gender characteristics. These emphasis development of tools and trainings and involvement of organisation to mitigate workplace hazards; creation of OSH awareness among workers; conduct of regular medical check-ups for developing national-level OSH database; mitigation of demand and supply-side barriers to the entire continuum of care; consideration of low-cost

primary and secondary preventive measures; and most importantly, provision of health security to informal workers that contribute to half the countries' GDP. Eventually it is important to integrate OSH into planning and implementation of primary healthcare in both the rural and urban areas, for all levels and age groups of workers, for males and females, and eventually move progressively towards the goal of UHC.

## REFERENCES

- Abraham, S. 2012. 'Family Practice among the Urban Poor in India.' *South Asia Journal of Family Medicine* 4 (5), June.
- Aggarwal, A. N., K. Chaudhry, S. K. Chhabra, G. A. D'Souza, D. Gupta, S. K. Jindal, S. K. Katiyar, R. Kumar, B. Shah, and V. K. Vijayan. 2006. 'Prevalence and Risk Factors for Bronchial Asthma in Indian Adults: A Multicentre Study.' *The Indian Journal of Chest Diseases & Allied Sciences* 48, pp. 13–22.
- Berman, P., R. Ahuja, and L. Bhandari. 2010. 'The Impoverishing Effect of Healthcare Payments in India: New Methodology and Findings.' *Economic and Political Weekly* 45 (16): 67, 17 April.
- Das, J., and J. Hammer. 2007. 'Location, Location, Location: Residence, Wealth and the Quality of Medical Care in Delhi, India.' *Health Affairs (Milwood)* 20, pp. w338–w351.
- Garg, C. C., and A. K. Karan. 2009. 'Reducing Out-of-pocket Expenditures to Reduce Poverty: A Disaggregated Analysis at Rural-urban and State Level in India.' *Health Policy and Planning*, March, <http://heapol.oxfordjournals.org/cgi/content/full/24/2/116>, accessed on 20 November 2013.
- Garg, C. C., and D. B. Evans. 2011. 'What is the Impact of Non-communicable Diseases on National Health Expenditures: A Synthesis of Available Data.' Discussion paper no. 3. *Health System Financing*. Geneva: WHO, <http://www.who.int/healthsystems/NCDdiscussionpaper3.pdf>, accessed on 20 November 2013.
- Garg, C. C., S. Mazumdar, P. G. Mazumdar, R. Goyanka, and S. K. Shukla. 2013. 'Equity in Universal Coverage for Select Chronic Diseases in India.' *Population Health and Nutrition Research Programme*, Institute for Human Development. Draft submitted to WHO, India Country Office, March.
- Gothi, D., and J. M. Joshi. 2011. 'Pulmonary Rehabilitation in Resource Poor Settings.' *The Indian Journal of Chest Diseases & Allied Sciences* 53.
- Government of India. 2013. 'Press Note to Poverty Estimates, 2011–12.' Planning Commission, July, [http://planningcommission.nic.in/news/pre\\_pov2307.pdf](http://planningcommission.nic.in/news/pre_pov2307.pdf), accessed on 25 February 2014.
- . 2011. 'Report of the Working Group on Disease Burden for 12<sup>th</sup> Five Year Plan.' WG-3 (2): *Non-communicable Diseases*, [http://planningcommission.nic.in/aboutus/committee/wrkgrp12/health/WG\\_3\\_2non\\_communicable.pdf](http://planningcommission.nic.in/aboutus/committee/wrkgrp12/health/WG_3_2non_communicable.pdf), accessed on 20 November 2013.
- Gupta, P., and J. Patel. 2012. 'Status of Occupational Health in India.' ANROEV Network and Asia Monitor Resource Center, [http://www.amrc.org.hk/system/files/India\\_0.pdf](http://www.amrc.org.hk/system/files/India_0.pdf), accessed on 21 November 2013.
- ILO (International Labour Organisation). 2013. 'World Day for Safety and Health at Work: Questions and Answers about the Prevention of Occupational Diseases,' [http://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---safework/documents/publication/wcms\\_211463.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_211463.pdf), accessed on 3 December 2013.
- Jindal, S. K. 2012. 'COPD: The Unrecognized Epidemic in India.' *Supplement to JAPI* 60.
- Kannan, K. P., N. S. Sastry, S. K. Nath, P. K. Ray, G. Raveendran, and S. V. Ramana Murthy. 2008. 'Contribution of the Unorganised Sector to GDP Report of the Sub Committee of a National Commission for Enterprises in Unorganised Sector (NCEUS) Task Force.' Working Paper No. 2, [http://nceuis.nic.in/Final\\_Booklet\\_Working\\_paper\\_2.pdf](http://nceuis.nic.in/Final_Booklet_Working_paper_2.pdf), accessed on 3 December 2013.
- Kolli R. 2011. 'Measuring the Informal Sector: Case Study of India,' [http://cwsc2011.gov.in/papers/sna/Paper\\_4.pdf](http://cwsc2011.gov.in/papers/sna/Paper_4.pdf), accessed on 20 February 2014.
- Kumar, A., S. Gupta, and S. Bhargava. 2012. 'Work and Livelihoods of the Informal Workers in NCR Delhi.' *IHD-SDTT Study*. New Delhi: Institute for Human Development, [http://ihdindia.org/Work%20and%20Livelihoods%20of%20the%20Poor%20in%20the%20National%20Capital%20Region%20\(NCR\).html](http://ihdindia.org/Work%20and%20Livelihoods%20of%20the%20Poor%20in%20the%20National%20Capital%20Region%20(NCR).html), accessed on 3 December 2013.
- La Forgia, G., and S. Nagpal. 2012. 'Government-Sponsored Health Insurance in India: Are You Covered?' The World Bank, <http://issuu.com/worldbank/publications/docs/9780821396186>. Feature story October 2012 on <http://www.worldbank.org/en/news/feature/2012/10/11/government-sponsored-health-insurance-in-india-are-you-covered>, accessed on 18 November 2013).
- MoHFW (Ministry of Health and Family Welfare). 2009.

- National Health Accounts India 2004–05*. New Delhi: Government of India.
- . 2005. *Report of the National Commission of Macroeconomics and Health*. New Delhi: Government of India.
- MoLE (Ministry of Labour and Employment). 2011. *Report of the Working Group on Occupational Safety and Health for the Twelfth Five Year Plan (2012 to 2017)*. New Delhi: Government of India, August, [http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wg\\_occup\\_safety.pdf](http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wg_occup_safety.pdf), accessed on 19 November 2013.
- MoSPI (Ministry of Statistics and Programme Implementation). 2013. *Key Indicators of Household Consumer Expenditures in India: 2011–2012*. National Sample Survey 68<sup>th</sup> Round. Government of India, June, <http://pib.nic.in/archieve/others/2013/jun/d2013062002.pdf>, accessed on 19 November 2013.
- Murthy, K. J. R., and J. G. Sastry. 2005. 'Economic Burden of Chronic Obstructive Pulmonary Disease'. NCMH Background Papers—Burden of Disease in India.
- NCEUS. 2008. 'Contribution of the Unorganised Sector to GDP: Report of the Sub-Committee of a NCEUS Task Force'. Working Paper No. 2. National Commission for Enterprises in the Unorganised Sector, June, [http://nceuis.nic.in/Final\\_Booklet\\_Working\\_Paper\\_2.pdf](http://nceuis.nic.in/Final_Booklet_Working_Paper_2.pdf), accessed on 31 March 2014.
- PHFI (Public Health Foundation of India). 2011. *High-level Expert Group Report on Universal Health Coverage for India*. Instituted by the Planning Commission of India, November.
- Planning Commission. 2014. *Data Tables*, <http://planningcommission.nic.in/data/datatable/index.php?data=datatab>, accessed on 6 March 2014.
- Pringle, S. 2012. 'Occupational Safety and Health in India: Now and the Future'. *Industrial Health* 50: 167–71.
- Rajan, S., and R. Balakrishnan. 2012. 'Management of Chronic Stable COPD'. *Supplement to JAPI*, 60: 31–37, February, [http://www.japi.org/february\\_2012\\_special\\_issue\\_copd/06\\_management\\_of\\_chronic.pdf](http://www.japi.org/february_2012_special_issue_copd/06_management_of_chronic.pdf), accessed on 3 December 2013.
- Reddy, K. S., S. Selvaraj, K. D. Rao, M. Chokshi, P. Kumar, V. Arora, S. Bhokare, and I. Ganguly. 2011. 'A Critical Assessment of the Existing Health Insurance Models in India'. Public Health Foundation of India, sponsored by the Planning Commission of India, New Delhi.
- Salvi, S. 2011. 'COPD: The Neglected Epidemic'. *Textbook of Pulmonary and Critical Care Med2*, eds S. K. Jindal. Jaypee Publications, pp. 971–74.
- Salvi, S. S., and A. Agrawal. 2012. 'India Needs a National COPD Prevention and Control Programme'. *Supplement to JAPI*, February 2012, vol. 60.
- Selvaraj, S., and A. K. Karan. 2012. 'Why Publicly-Financed Health Insurance Schemes are Ineffective in Providing Financial Risk Protection'. *Economic and Political Weekly* 47 (11): 60–68, 17 March.
- . 2009. 'Deepening Health Security in India: Evidence from National Sample Surveys since 1980s'. *Economic and Political Weekly* 44 (40), 3 October.
- Sharma, B. B., and V. Singh. 2011. 'Pulmonary Rehabilitation: An Overview'. *Lung India* 28 (4): 276–84.
- Thakur, J. S., S. Prinja, C. C. Garg, S. Mendis, and N. Menabde. 2011. 'Social and Economic Implications of Non-communicable diseases in India'. *Indian Journal of Community Medicine*, 36:13–22, <http://medind.nic.in/cgi/ndimj.pl?plrd+MFN-007462>, accessed on 18 November 2013.
- van Doorslaer, Owen O'Donnell, Ravi P. Rannan-Eliya, Aparnaa Somanathan, Shiva Raj Adhikari, et al. 2006. 'Effect of Payments for Health Care on Poverty Estimates in 11 Countries in Asia: An Analysis of Household Survey Data'. *The Lancet* 368 (9544), 14 October, pp. 1357–64.
- Van Sickle, D. 2005. 'Perception of Asthma among Physicians: An Exploratory Study with the ISSAC Video'. *European Respiratory Journal* 26, pp. 829–34, <http://erj.ersjournals.com/content/26/5/829.full.pdf>, accessed on 28 November 2013.
- Van Sickle, D., and R. B. Singh. 2008. 'A Video Simulation Study of the Management of Asthma Exacerbations by Physicians in India'. *The Clinical Respiratory Journal* 2, pp. 98–105, <http://www.ncbi.nlm.nih.gov/pubmed/20298314>, accessed on 28 November 2014.
- Vijayan, V. K. 2008. 'Occupational Lung Diseases in Management of Occupational Health and Safety Delivery: Scopes and Challenges'. A National Workshop, National Institute of Occupational Health (ICMR), Ahmedabad (personal communication).
- WHO (World Health Organisation). 2013. 'WHO Global Plan of Action on Workers' Health (2008–2017): Baseline for Implementation'. *Global Country Survey 2008/2009*, [http://www.who.int/occupational\\_health/who\\_workers\\_health\\_web.pdf](http://www.who.int/occupational_health/who_workers_health_web.pdf), accessed on 28 November 2013.
- . 2012. 'Factsheets on COPD', <http://www.who.int/mediacentre/factsheets/fs315/en/index.html>, accessed on 28 November, 2013.
- . 2011a. 'NCDs Country Profile'. Geneva: WHO, [http://www.who.int/nmh/publications/ncd\\_profiles2011/en/index.html](http://www.who.int/nmh/publications/ncd_profiles2011/en/index.html), accessed on 28 November 2013.
- . 2011b. 'World Health Statistics'. Department of Measurement and Health Statistics, Global Burden of Disease Death Estimates. Geneva: WHO.