National Strategy for the Elimination of Asbestos - Related Diseases (2018-2030)

And

Five Years Action Plan (2018-2022) in Lao PDR

Department of Hygiene and Health Promotion
Ministry of Health

Contents

Part I

Introduction

1.1 Introduction

Asbestos is a group of minerals fibrous that naturally occurring which possess high tensile strength, flexibility and resistance to heat. There are 2 types of asbestos: Serpentine which is chrysotile; and amphibole is including crocidolite, amosite, anthophyllite, tremolite and actinolite. Chrysotile has constituted 90% of all asbestos marketed over the past 30 years and only one form that still being produced by a handful ofcountries. Asbestos is poor heat conduction and relative resistance to chemical attack.It is durable in the environment, does not disintegrate in the air or does not dissolve in the water. It will last for many years, and was considered the best thermal insulation. Therefore, it has been used to produce more than 3,000 different items such as roof tiles, automotive brakes, wallboards, insulation products and etc[1].

The WHO report on the Fact sheet Reviewed in August 2017 articulated that all forms of asbestos includingchrysotile cause cancer in humans. About 125 million people in the world are exposed to asbestos at the workplace. At least 107,000 people die each year from asbestos-related lung cancer, mesothelioma and asbestosis. Approximately half of the deaths from occupational cancer are estimated to be caused by asbestos. In addition, it is estimated that several thousand deaths annually can be attributed to exposure to asbestos in the home[2].

Direct exposure to asbestosoccurs toworkerswhodirectlyhandleasbestos or asbestos-containingproducts(ACP) in the roof tilefactory, installingthe rooftile, carpenter, electrician, plumber, firefighter, automotiverepair, installinginsulation, mining, construction, ports, power plants, refineries, steelplants and others.Indirect exposureoccurs tothe workerswho do not directlyhandleasbestosor ACP but whoworknearby as well as relatives of thoseworkers. People whorenovate and mainternantthierown house are alsoexposed non-occupationally. [3].

Currently, some asbestos-exportingand consuming countries (i.e., they have no ban of asbestos) are challenging therecommendation to stop using asbestos, often using economic arguments. They argue that the introduction of banning all forms of asbestos will have negative economic impacts on national, private sector, and household income at national and local levels[4]. However, available evidence does not support this argument.[5]In addition, the WHO recent report “Asbestos-Economic assessment of bans and declining production and consumption”, stressed two key findings [6]:

1. There are no observable mid-orlong-term negative economic impacts from bans or a decline in asbestos production or consumption at the country-level, and no observable persistent negative effects at the regional level;
2. There are substantial and increasing costs associated with the continuing production and use of asbestos, with the potential to far outweigh the short-term economic benefits.

1.2 Legislations Background (International Laws)

Action on elimination of ARDs has a sound international basis that includes primarily ILO international instruments, WHO recommendations and multilateral environmental agreements as listing below[5]:

- The Occupational Cancer Convention, 1974 (No.139)
- The Asbestos Convention, 1986 (No.162)
- The Chemicals Convention, 1990 (No.170)
- The Resolution on Asbestos of the 95th International Labor Conference (2006)
- The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 and entered into force in 1992
- The 58th World Health Assembly
- WHO Recommendation(the 60th World Health Assembly)–Global Plan of Action on Workers' Health 2008-2017
- ILO/WHO Outline for the Development of National Programmes for Elimination of Asbestos-Related Diseases (NPEAD)

Part II

Information about Population, Social and Economic, Situation of Asbestos using and related Regulations in the Lao PDR

According to the National Statistical Bureau report 2015, the population of Laos is 6,492,400 (female 3,237,600), with most people – 63 percent – still living in rural areas. However, urbanization is occurring at a rate of 4.9 percent each year. The country is largely mountainous, with the most fertile land found along the Mekong plains. The river flows from north to south, forming the border with Thailand for more than 60 percent of its length.[i]

The key development goal of the Government is to graduate from Least Developed Country status by 2020 and further, to consolidate middle-income country status by 2030. Laos has been moving to a market-oriented economy since the 1986s.

Over the last decade in particular, it has been one of the fastest growing economies in South-East Asia, recording growth of about 8 per cent annually. The government of Laos aims to reach market economy and industrialized status by 2020.'[ii]

The government's policy to encourage the industrialisation of Laos' economy is resulting in changes to the country's economic makeup, with the industrial and service sector gradually growing while the agriculture and forestry sector is declining. The Lao government policy includes development of Special Economic Zone (SEZs) to boost economic growth and job opportunities for local people. Laos currently has 11 SEZs.[iii]

The National Statistical Bureau report 2015 also advises that the Labour Force is more than 3.8 million and they can be found in agriculture sector 23.7 %; industry sector 29.1 %; servicesector 47.2 % and GDP growth is 7.9 % (2015) and GDP per capita 1,790 US$.

Lao has not had laws and regulations specific to asbestos management, but there are some regulation related to asbestos as following:

Prohibition based on the decision on Industrial Substance and Chemical Management no. 1041/MOIC.DIH issued on 28 May 2012, Blue and brown asbestos were banned to produce, import, trans-boundary and use in Laos, but excludedchrysotile that can use under specific controlling and needs to be registered before imported to Laos.

- Article 15: To classify substances and hazardous chemicals:

Category 1: High risk substances and hazardous chemicalsare prohibited. This means that importing, using, producing and keeping are not allowed. Exceptions arefor scientific research, but the importer/user needs to request to department of industry and handicraft (DOIC) and the government for consideration and approval.

Category 2: Medium risk substances and hazardous chemicalsareallowed to be used for running the business, but it needs to be managed before importing or running the business. It needs to be registered and obtainthe technical certificate from department of industry and handicraft.

Category 3: Low risk substances and hazardous chemicalsareare allowed to be used generally, but it needs to be registered with department of industry and handicraft before importing or running a business.

White asbestos (chrysotile) was in the 2nd category of this regulation. This means that chrysotile is allowed to be used, but it needs to be registered and obtainthe approval from the department of industry and handicraft before importing or running business.

- Article 17: Prohibition of department of industry and handicraft

1) Processing plants are not allowedto produce, importorexport, sale or have the high risk substances and hazardous chemicals. Exceptionis when it was approved by the government through DOIC for special case.

2) Processing plants are not allowedto produce, import or export, sale or have the medium risk substances and hazardous chemicals. Exception is when it was approved by DOIC.

2.1 Relevant laws and regulations:

- Ministry of Industry and Commerce:

1) The decision on Industrial Substance and Chemical Management no. 1041/MOIC.DIH issued on 28 May 2012;
2) Law on Industrial Processing (amended) No. 48/NA, issued on 27 December 2013;
3) Agreement on managing the waste from the industrial and handicraft processing No.0555/IC, issued on 20 March 2012;

- Ministry of Agriculture and Forestry:

  1) Decision of the Minister of Agriculture and Forestry on Organic Agriculture Standards No. 1666/MAF Issuing Date: 30-12-2005

     Group IV: Production, Preservation, Packing and Transportation

     Article 21: Processing Systems 2. Filtration substances shall not be made of asbestos, or any other substance that may negatively affect the product.[iv]

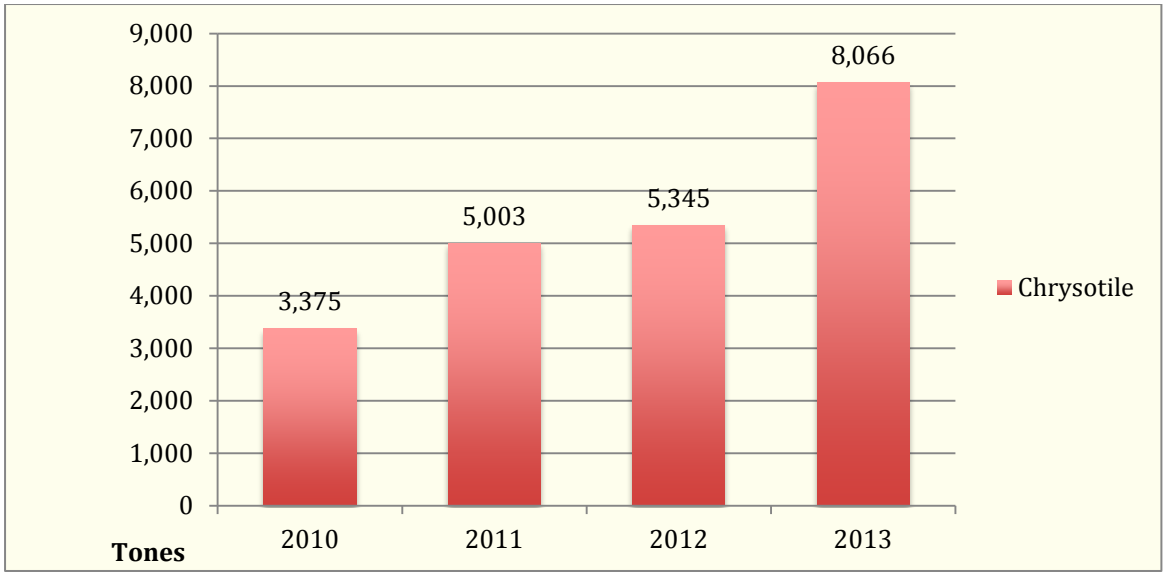
- Ministry of Natural Resources and Environment:

  1. Law on Environment Protection (amended) No.29/NA, issued date 18Dec. 2012.
  2. Law on Mining (amended) No.18/NA, issued date 20/12/2011 article 26, 57, 58, 59
  3. Agreement on Environmental National Standard No.2734/PMO-WREA, issued on 7 December 2009.
  4. Decree on Approved and adopted the projects accounting and activities that will be conducted preliminary study on the impact to the environment or impact on the environment, society and nature No.8056/MoNRE, issued date 17 Dec.2013.
  5. Instruction on the Management of Hazardous Waste, No. 0744/MoNRE, date 11 February 2015
  6. Guideline on Pollution Control No. 0745/MoNRE, date 11 December 2015

Import and consumption of asbestos per year (total and per major uses and forms):Laos PDR asbestos is still being imported and used in the building industry. It is present in roofing tiles water pipes and other building materials. When workers handle products that contain asbestos they create asbestos dust. This releases very small fibres into the air. As roof tiles and insulated pipes get old and decay, or as people cut and move new tiles or pipes, asbestos fibres are released into the air and attach to clothes, hair, skin and enter the lungs.

The result of the survey showedthat quantity of asbestos (chrysotile)imported into Laos from 2010 to 2013 was approximately 21,000 tons of asbestos, changing from 3,375 tons (in 2010) to 8,066 tons (in 2013). Most of raw asbestos were imported from China, Russia and Kazakhstan. Some factories imported raw asbestos by themselves and some factories bought from other factories based on their annual approval from MOIC and concerned authorities.

Table 1: Chrysotile asbestos imported to Lao P.D.R.



The import of asbestos-containing materials:Lao PDR has the border with 5 countries and has 22 international checkpoints, 32 Local Checkpoints, and 48 traditional checkpoints (Annex 1). During the development of this profile, data was collected from 10 custom offices in 7 provinces;there were raw asbestos and Asbestos Containing Material (ACM) imported to Laos e.g. Brake lining and pads for motor vehicle; Roof tiles; Insulation; Thermometer; Gypsum; and Asbestos textiles… (Annex 2)

Table 2: Total imported Roof tiles from the 10 custom offices in 7 provinces in 2012 - 2014

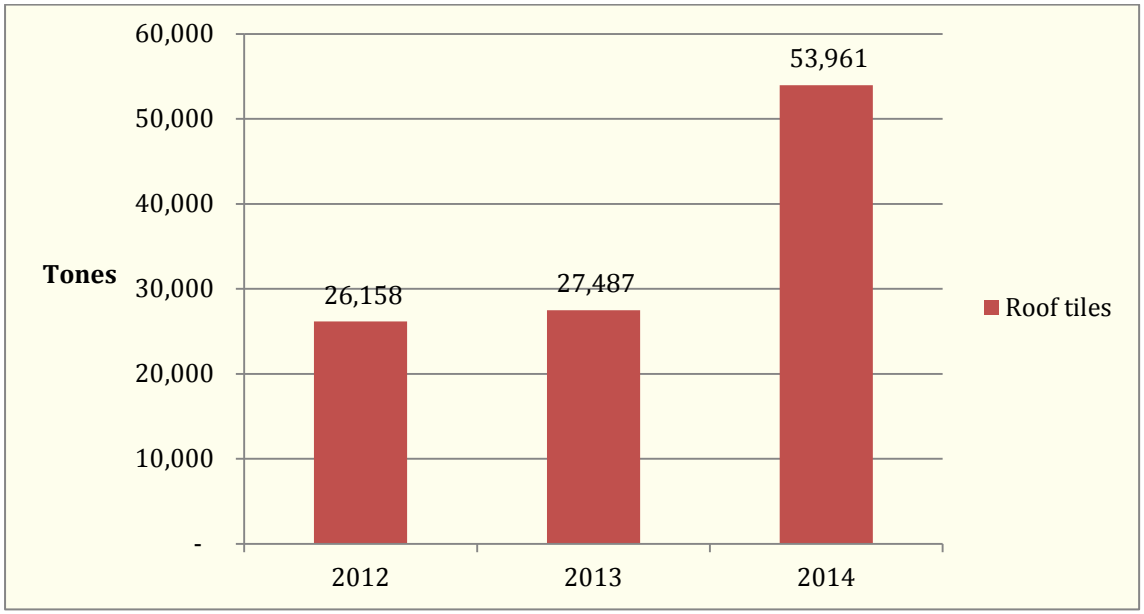


Table 3: Total importedgypsum from the 10 custom offices in 7 provinces in 2012 - 2014

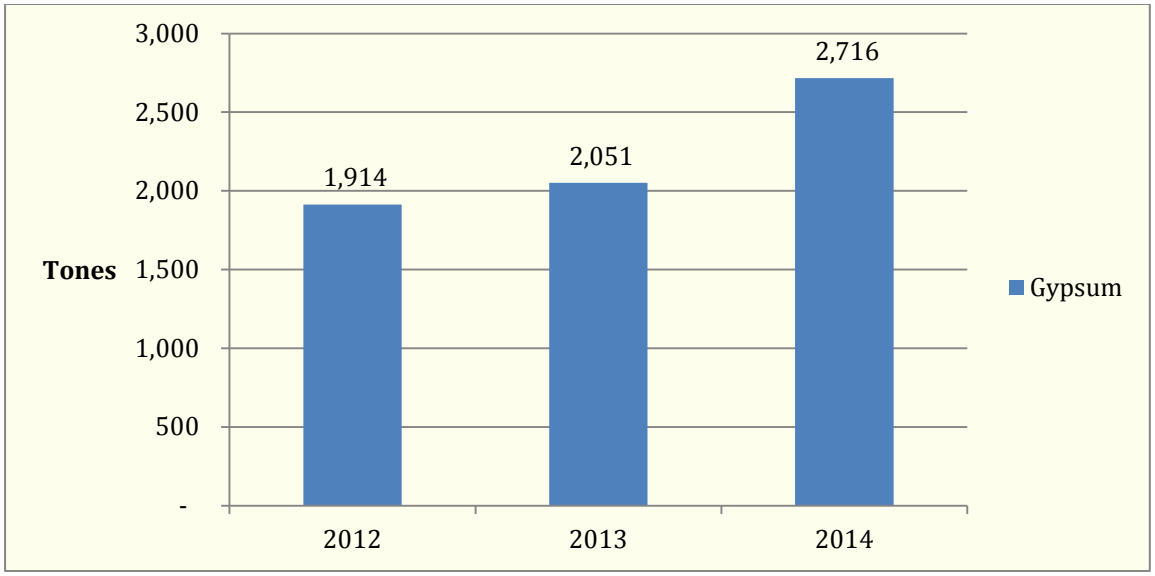
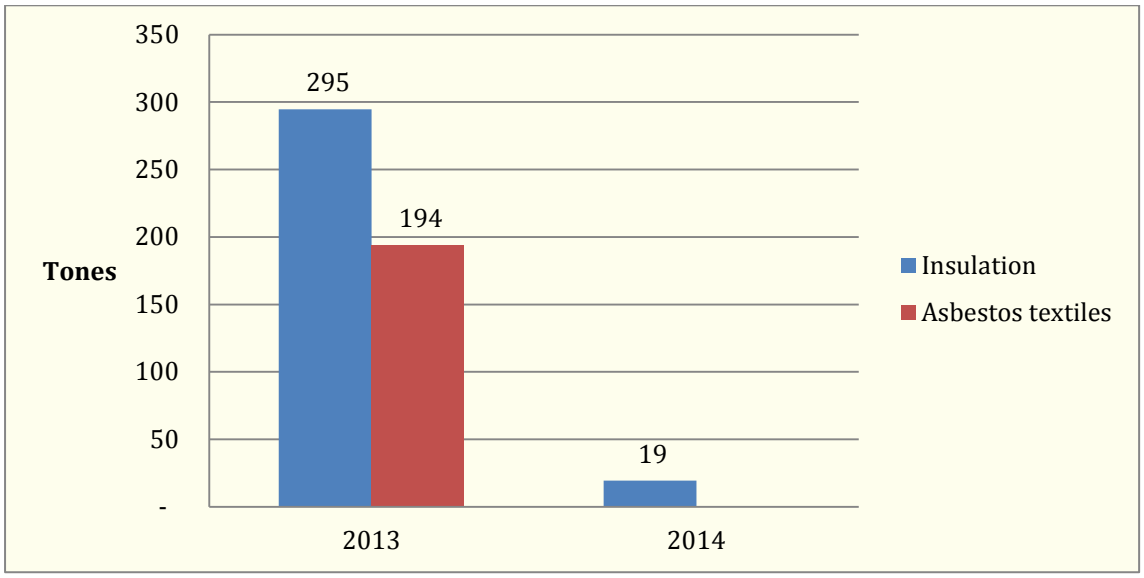


Table 4: Total imported ACM from the 10 custom offices in 7 provinces in 2013 - 2014



Lao P.D.R. does not have asbestos factory and has not explored for asbestos mine.

From the preliminary survey, the domestic production of asbestos-containing materialsin the Lao PDR is mainly for producing roof tiles and construction materials. No mapping of where else it is used yet. There were 16 roof tiles factories (1 stopped temporarily).

Estimated total number of workers exposed to asbestos in the country based on the nationwide survey during 2012-2015 found there were 16 roof tile factories (1 stopped temporarily) and there were around 501 workers working in those factories.

2.2 Asbestos UsingFactory

Nº	Factory	Village	District	Province	Established	Community (1Km)	Investor	# Workers		Biography Registered		Chrysotile	Imp. From	Remarks
1	Lao Houng Roof tile factory	Khok Sa-at	Xaithany	Vientiane Cap.	1998	☐	Chinese	42	12	33	6	☐	Russia	
2	Construction Producing Co.,	Na Hai	Hadsaifong	Vientiane Cap.	2009	☐	Chinese	15	4	13	4	☐	China	
3	Twin Elephants Brand Roof tile	Somsavath	Pak Ngeum	Vientiane Cap.	2008	☐	Chinese					☐	China	
4	Twin Elephants Brand Roof tile	Xiengkhuane	Hadsaifong	Vientiane Cap.	2011	☐	Chinese					☐	China	
5	Phousy Brand (Roof tile factory)	Done Mai	Luangprabang	LuangPrabang	2003	☐	Chinese	13	7	12	7	☐	CN/Rus.	
6	DDK Roof tile factory	Pha O	Pak Ou	LuangPrabang	2005	☐	Chinese	35	15	34	15	☐	China	
7	Lion Brand Roof tile factory	Sang	Nambak	LuangPrabang	2011	☐	Lao	44	20	33	16	☐	Russia	
8	Twin Gaurs Brand Roof tile	Phonesavanh	KeoOudom	Vientiane Prov.	2005	☐	Chinese	25	13	10	8	☐	Russia	
9	DDK Roof tile factory	Nongkhone	Phon Hong	Vientiane Prov.	2007	☐	Chinese	38	15	11	5	☐	China	
10	VILACO factory	BeungHua Na Tai	Sebangfai	Khammuane	2004	☐	Vietnamese	59	25	46	17	☐	China	
11	V-pax Roof tile factory		Adsaphangthong	Savannakhet	2007	☐	Lao	52	13	29	3	☐	China	Temp.
12	DDK Roof tile factory	Nathad	Outhoumphone	Savannakhet	2009	☐	Chinese	30	4			☐	China	
13	Golden Horse Brand Roof tile	HouyLeuSy	Bachieng	Champasack	2008	☐	Chinese	60	20	36	20	☐	China	
14	LC Roof tile Co.,	Laokha	Thaphabath	Bolikhamsay	2008	☐	Chinese	53	17			☐	China	
15	Dragon Roof tile factory	Nokkachork	Huaysai	Bokeo		☐	Chinese	12				☐	China	Seasonal
16	DDK Roof tile factory	Nahoy	Peak	Xiengkhouang	2014	☐	Chinese	23	13	-	-	☐	China	
							Total =	**501**	**178**	**257**	**101**			

Industries that presently use asbestos in the country where workers may have been exposed to asbestos.

Lao PDR has around 29,628 industrial processing plants, of which 714 are large factories, 1,043 are medium and 6,686 are small factories, and 21,185 are family processing units.

In addition to the roof tile factories mentioned above, there are also factories and companies where their workersmay have been exposed to asbestos by using ACM, such as:

1. Manufacturing of Construction Materials (Drained Pipe…)
2. Automobile maintenance
3. Manufacturingwhich use boiler
4. Asbestos import-export company
5. Building/Road Construction-Renovation Co.,

Industries in which their workers havehigh risk of exposure and the estimated total number of workers is high. ‘As the Lao economy industrialises and modernises, the construction materials industry will continue to grow, mainly the industry of plastic tubes, pipes, cement, corrugated roofing, iron bars, gravel and marble. Therefore, the occupations with a high risk of asbestos exposure would be including:

1. Asbestos Roof tile factory workers
2. ACM Construction Materials workers
3. Construction & Demolition workers/inspector/engineer
4. Automotive maintenance workers
5. The factory using Boiler workers
6. Fire-fighters
7. Industrial workers using Insulators
8. Power plant workers

Estimate of the burden of diseases related to asbestos: Based on analysisby the Institute for Health Matrics and Evaluation, University of Washington, USA on the world’s health levels and trends from 1990 to 2013. Below are the charts to compare causes by ARDs and risks within the Lao PDR.[v]

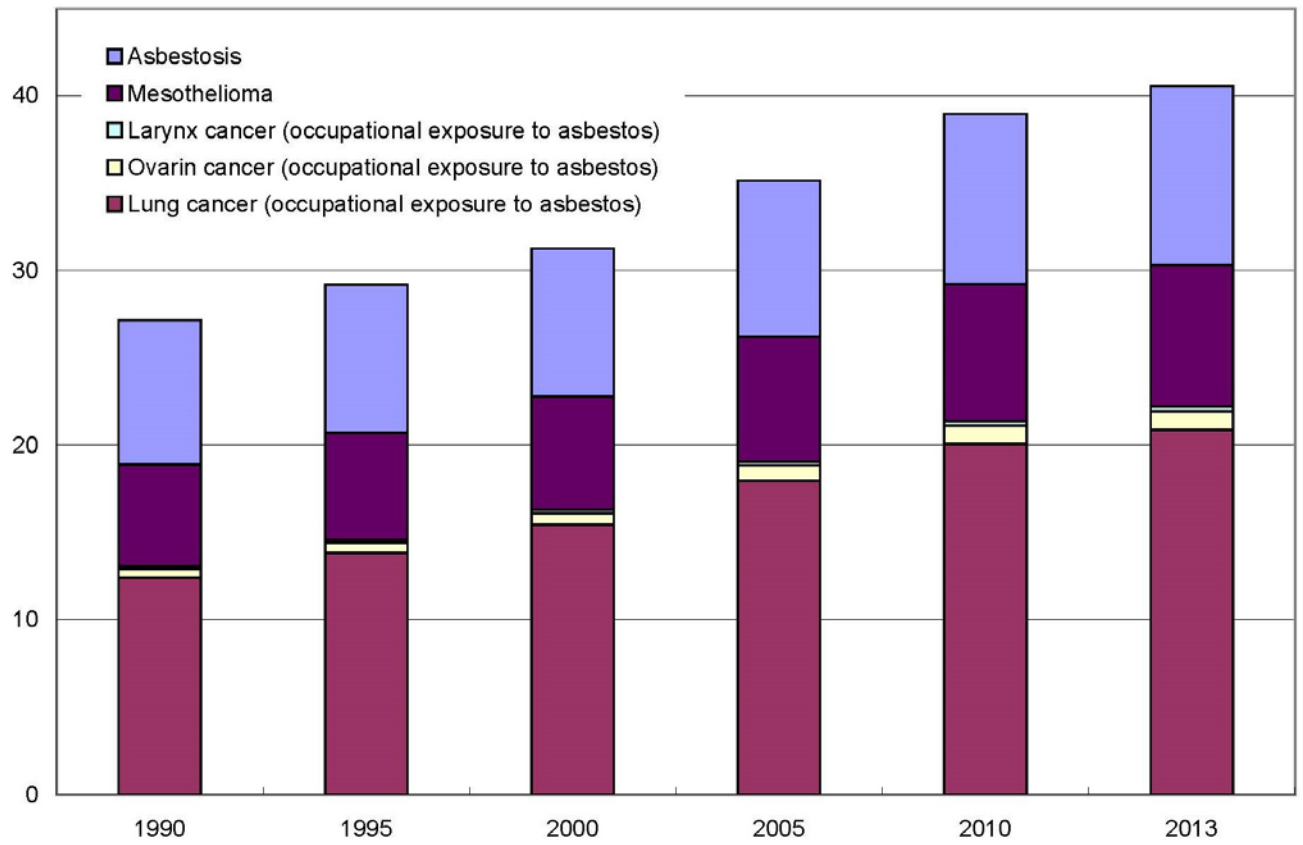
Table 5: Lao PDR: estimates of the burden diseases caused by asbestos

http://vizhub.healthdata.org/gbd-compare/

Deaths	1990	1995	2000	2005	2010	2013
Occupational cancer (asbestos)	15.83	17.35	19.10	22.16	24.71	25.59
Mesothelioma - A	2.75	2.78	2.80	3.09	3.33	3.39
Lung cancer - B	12.44	13.85	15.44	17.97	20.07	20.85
Ovarin cancer - C	0.47	0.53	0.67	0.87	1.06	1.08
Larynx cancer - D	0.18	0.18	0.20	0.22	0.25	0.25
Mesothelioma - A+E	5.81	6.14	6.45	7.16	7.83	8.13
Mesothelioma (occupational exposure to asbestos) - E	3.07	3.36	3.66	4.07	4.50	4.73
% of occupational mesothelioma - A/(A+E)	47.26%	45.29%	43.33%	43.19%	42.57%	41.78%
Lung cancer/Mesothelioma - B/A	4.53	4.98	5.52	5.81	6.02	6.14
Asbestosis(total)- F	8.27	8.47	8.51	8.93	9.77	10.26
Total :B+C+D+(A+E)+F	27.16	29.19	31.27	35.15	38.97	40.57

Table 6: Lao PDR: estimates of the burden diseases caused by asbestos

http://vizhub.healthdata.org/gbd-compare/



Prevalence of asbestosis (total number of workers with diagnosed asbestosis, asbestos-related lung cancer and mesothelioma to-date) – national data, a breakdown by industries if available. No cases of mesothelioma due to the doctor in Laos cannot diagnose mesothelioma.

Lung cancer is 4th in all cancer population in Lao and about 3.96% the leading cancer site of statistic of Lao National cancer center 2010 to 2013 with clinical examination, imaging and pathology Diagnosis. Lung cancer causes of deaths in a short period.

Table 7: Global: GBD2016 (published in 2017) Estimates of ARDs Deaths

http:llvizhub.healthdata.orglgbd-comparel (Observed)

Table 8: Global: GBD2016 (published in 2017) Estimates of ARDs Deaths

http:llvizhub.healthdata.orglgbd-comparel (Observed)

Deaths	1990	1995	2000	2005	2010	2015
Occupational Asbestos Cancer	146,844	161,404	172,309	185,360	203,738	222,321
Mesothelioma (occup) - A	15,206	16,722	18,559	20,720	24,107	27,612
Lung Cancer (occup) - B	123,231	135,225	143,359	153,540	167,304	181,450
Ovarin Cancer (occup) - C	3,845	4,359	4,754	5,051	5,719	6,022
Larynx Cancer (occup) - D	2,954	3,159	3,194	3,237	3,424	3,743
Asbestosis (occup) - E	1,608	1,939	2,442	2,812	3,185	3,495

Mesothelioma (total) – A+F	16,783	18,483	20,493	22,816	26,423	30,208
Mesothelioma (non-occup) - F	1,578	1,762	1,934	2,096	2,317	2,596
% of occupational - A/(A+F)	90.6%	90.5%	90.6%	90.8%	91.2%	91.4%
LC / Meso - B/A	8.10	8.09	7.72	7.41	6.94	6.57
Asbestosis (total) – E+G	1,609	1,940	2,442	2,813	3,186	3,495
Asbestosis (non-occup) - G	0	0	0	0	0	0
% of occupational – E/(E+G)	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%
Total = B+C+D+(A+F)+(E+G)	148,422	163,166	174,243	187,456	206,055	224,918

Table 9: Top 10 Most Common Cancer Cases in 2010-2013

Primary site	Male	Female	Total	
	Number	Number	Number	%
Liver	25	21	46	36.50
Lymph node	10	6	16	12.69
Oral cavity	3	3	6	4.76
Lung	5	0	5	3.96
Bone	4	1	5	3.96
Thyroid	0	4	4	3.17
Breast	0	4	4	3.17
Skin	2	2	4	3.17
Stomach	2	1	3	2.38
Cervix	0	2	2	1.58
Total	**51**	**44**	**95**	**75.34**

Table 10: Top leading cancer site in female patients from 2010-2013 by age group

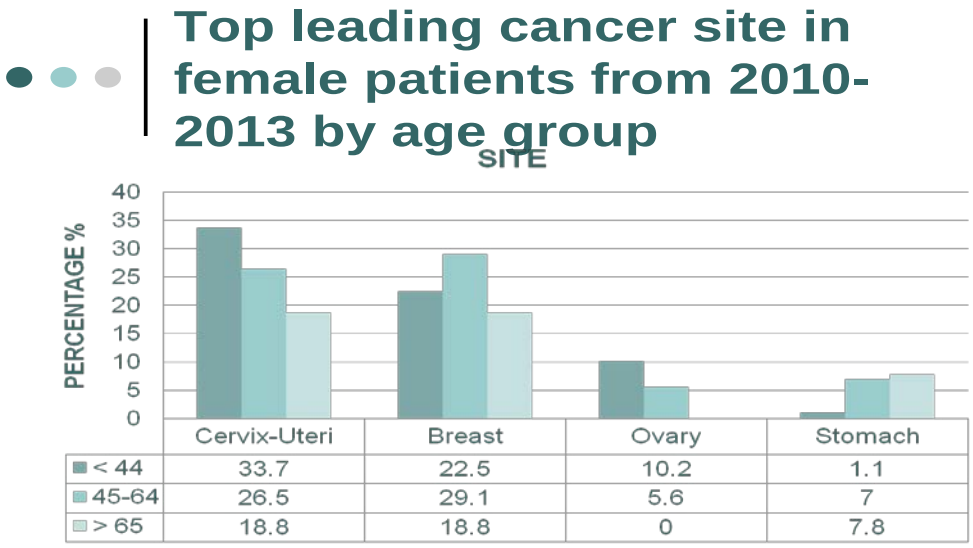


Table 11: Top leading cancer site in male patients from 2010-2013 by age

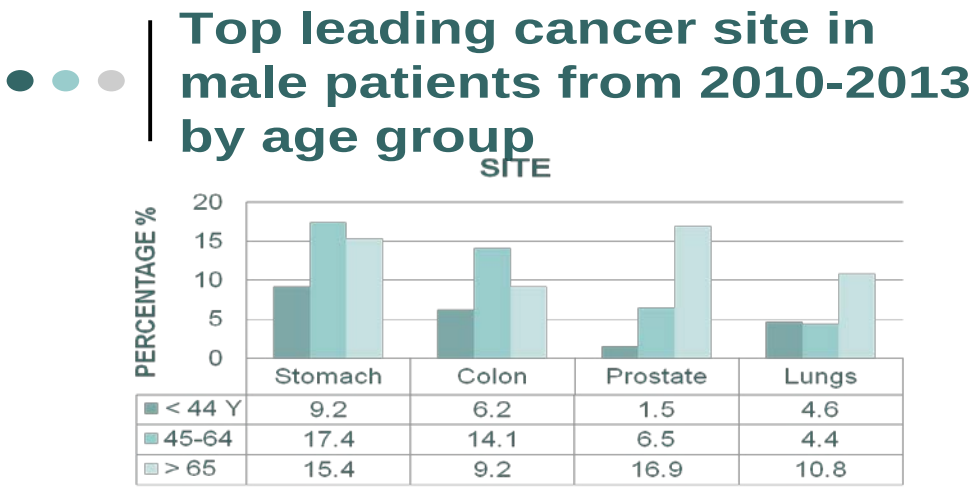


Table 12: The number of lung cancer partients

No.	Provincial hospital	2012		2013		2014		2015		Total		
		M	**F**	**M**	**F**	**M**	**M**	**F**	**M**	**F**	**M**	**M**
1	Vientiane cap.	27	21	41	27	38	34			188	106	82
2	Champasack	6	1	8	4	11	7			37	25	12
3	Savannakhet	8	3	10	7	9	6			43	27	16

4	Xiengkhouang			1	3	3	4	1	1	13	5	8
5	LuangPrabang			9	6	5	0	2	1	23	16	7
6	Vientiane Prov.			8	3	5	0	1	0	17	14	3
7	Cytology Div.			2	3	7	5	4	2	23	13	10
	Total	**41**	**25**	**79**	**53**	**78**	**56**	**8**	**4**	**344**	**206**	**138**

According to the survey, total of lung cancer survey recorded since 2012 to May, 2015 from three central hospitals (Mahosot, Sethathirath and Friendship hospital), cytology division and five provincial hospitals (Xiengkhouang, LuangPrabang, Savannakhet and Vientiane provincial hospital). In the year 2012 to 2015 total number of cases was 344 (206 = 59.88% men and 138 = 40.11% women).

The number of patient in the capital city is higher than in the provincial hospitals because most of the patients came to treat in the capital city.

Based on the survey, there were many cases of lung cancer and pleural cancers in the central and provincial hospitals, but the doctors could not determinethose cases were mesothelioma as theyneed to be pathologically confirmed which expertise is not yet developed in Laos Asthe next step, the survey team is preparing to collect samples from suspected patients and send to a modernized clinical hospital to determine lung cancer and mesothelioma cases.

Total number of workers eligible for compensation for asbestos-related diseases, such as asbestosis, lung cancer and mesothelioma (per year) and the numbers of individuals compensated yearly: Not available..

National enforceable occupational exposure limits for chrysotile asbestos: Lao P.D.R. does not have specific regulation to enforce the occupational exposure limits for chrysotile. However there is the agreement on Environmental National Standard No.2734/PMO-WREA, issued on 7 December 2009 mentioningthat:

Article 5.6.1 Air Emission Standards for Industrial Factories; table number 18 on the particulate substances in the trade, industrial, producing process, fuel burning equipment or wood processing industry should not releasemorethan 100 mg/m^3.

Article 5.6.2 Air Emission Standards for exiting cement factories (including general cement burning plant; white cement burning plant; cooling plant; cement clashing and coal crushing plant) emitted air pollution in the particulate matter should not releasemore than 300 mg/m^3; and for new cement factories should not release more than 120 mg/m^3.

Article 8.1 the total suspended particulates (TSP) should not releasing more than 0.33 mg/m^3.

Article 8.2 the particulate matter smaller than 10 microns (PM10) should not releasemore than 0.12 mg/m^3.

The system for inspection and enforcement of the exposure limits;estimated economic losses due to asbestos-related diseases; Major studies on epidemiology of asbestos-related diseases in the country are not available.

2.3 Challenging Issues

- Base on the imported data in 2013 Laos is the highest asbestos consumption per capital in the world with around 1.2 kg per person per year.
- Few laws and regulations mentioned about asbestos.So far there is no documentthat mentioned about banning all types of asbestos including chrysotile asbestos and ACM.
- There are many ACM imported to Laos in the last decades and it still remaining in the country which may cause an impact to people when they renovate their home.
- Government officers, workers and communities including the owner of the asbestos usingfactories have limited understanding on the impact of asbestos onhealth.
- Asbestos roof tile factory's workers don't know how to protect themselves, donot have enough PPE and sometime theydon't want to use PPE.
- There is no management, monitoring and surveillance system on the health of workers working in the asbestos using factories and communities living around the factories.
- There is no research about asbestos and its impact onhealth in Lao PDR.

Part III

Visions, Roles, Goals and Principles

3.1 Visions:

- To eliminate asbestos exposure
- Workers and people have good quality of life and are free from ARD**.**

3.2 Roles:

Workers, employees and public must be responsible for protecting their own health and their worker's health from asbestos, and to be healthy by coordinating with concerned sectors, including diagnosis, treatment, rehabilitation and compensation for ARD patients fairly and sustainably (or, in a fair and sustainable manner)..

3.3 Goals

- To protect workers and all people from exposure to asbestos and
- to eliminate ARD.

In addition, this strategic and action plan willsupport the Sustainable Development Goal Strategy (SDGS), especially SDG3: Ensure Healthy Lives and Promote Wellbeing for All Ages; SDG8:Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; SDG11: Make cities and human settlements inclusive, safe, resilient and sustainable; SDG17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

3.4 Principles

1. Surveillance:use controlling approach and be careful in all activities related to asbestos to ensure that there is no increased risk in the workforce and community.
2. Decisions based on the results of scientific research: all decisions should be based on comprehensive and reliable analysis from international sources and responsible ministries.
3. Transparency: all activities should be conducted in an open and transparent manner and all partners must be able to access the available information.
4. Community Engagement: considering community issues and workplaces safe from asbestos should focus on the interests and concernsof all Lao people.
5. Coordination: all activity must be planned and operated effectively by all relevantstakeholders.

Part IV

Key strategies and priority areas

4.1 Key strategic directions:

To achieve the goal, this strategy has 7 keys strategic action plans. Each key strategic action plan has objectives, outcomes and key activities as below: (for more details please see in part 6)

4.1.1 Set up the national committee and focal points to promote proper informationand health education

4.1.2 Develop policy, decision and principles on the ban of asbestos, including chrysotile.

4.1.3 Setting up institutional framework, capacity building for enforcement and implementation of policy and regulatory framework on mitigation of asbestos exposure (customs inspection, sampling, testing).

4.1.4 Establishing monitoring, evaluation and disease surveillance framework including to update national asbestos profile, collecting and sharing data and information on asbestos containing material, its imports, production and volume of asbestos containing wastes.

4.1.5 Safe removal or demolish ofbuildings, and housesthat have ACM, worker's safety and waste management of ACM.

4.1.6 Improving capacity for diagnosis, treatment, rehabilitation of patients and disabled people and compensation for ARD patients.

4.1.7 Carry out research on ARD surveillance and develop the curriculum for teaching in the university.

4.2 Details of each key strategic action:

4.2.1 Key Strategy Action 1: Set up the national committee and focal points to promote proper information, and health education

This key strategy action is to set up the national committee on the elimination of ARD and identify the roles and responsibilities, including coordination mechanism of the central to local levels and coordinate with concerned stakeholders to manage the risk that might impact to health of people by asbestos.

4.2.2 Key Strategy Action 2:Develop policy, decision and principles on the ban of asbestos, including chrysotile.

This key strategy action is targeted to ban all types of asbestos, which includes stop importing, distributing and selling asbestos in the country based on compliance tothe regulations related to ARD of the relevant ministries such as conventions, decrees, laws, regulations, agreements, and including the developmentofstandards to promote and use

alternative substances.These alternatives have less impact or noimpact to health and substitutes asbestos in producing roof tile and other materials.

4.2.3 Setting up institutional framework, capacity building for enforcement and implementation of policy and regulatory framework on mitigation of asbestos exposure (custom inspection, sampling, testing).

This key strategy action is to strengthen the capacity, improve knowledge and experience of the staff of concerned ministries at all levels to have sufficient knowledge and skills, including sufficient number of staff to enforce endorsed law related to ban asbestos and ACM effectively.

4.2.4 Establishing monitoring, evaluation and disease surveillance framework including to update national asbestos profile, collecting and sharing data and information on asbestos containing material, its imports, production and volume of asbestos containing wastes.

This key strategy action is to establish monitoring, evaluation and disease surveillance framework, as well as reports on the management, the use of asbestos and ACM. And to ensure that aNational Asbestos Profile has been updated and shared to concerned stakeholders.

4.2.5 Safe removal or demolishingofbuildings, and housesthat have ACM, worker's safety and waste management of ACM.

This key strategy action is to strengthen the capacity of concerned ministries, organizations or companies that are responsible for safely removing theACMs from building; and for ensuring that the company owner and workersare made aware of the impact of asbestos and ACM, learned and had sufficient experience on how to protect themselves during removalor demolishing the building safely.A company with special permission should handle demolition and safe removal of ACM depending on needs and inspection results. Their workers should receive mandatory training on safe removal process.

4.2.6 Improving capacity for diagnosis, treatment, rehabilitation of disabled people and compensation for ARD patients.

This key strategy action is to strengthen the capacity of medical doctorson diagnosis, treatment, rehabilitation, palliative care and compensation for ARD patients in a fair and sustainable manner.

4.2.7 Carry out research on ARD surveillance and develop the curriculum for teaching in the university

This key strategy action is tocollect the scientific evidenceonchrysotile asbestosin its relation toasbestosis, lung cancer and mesothelioma. It is unnecessary to repeat studies with the same objective as earlier studies ("metoo" study), but havinga "local context" is sometimes justified and necessary.The study to find new cases in earely stage and study prevalence and incidenceof ARDs and recommendation to improve surveillance of ARds are important in the country. The studies maybe conducted byobservational, analytical study, screeningand other methods.Then use those reresearches to identify problems,

solving the issues and making a decision based on evidence. Asbestos has been usedin many products, especially industrial sector which may impact to the worker and people. So this topic should be integrated into the university curriculum of medical and public health students.

4.3 Priority area

4.3.1 Employment:

4.3.1.1 The workers working in 16 roof tile factories and communities living around the factories in 9 provinces.

4.3.1.2 Workers handling/carrying, inspecting and transporting asbestos containing materials when it is imported

4.3.2 Consumers and handlers of ACM

4.3.2.1 Consumers of ACMs, construction contractors or workers who work on demolition or removing ACMs from building.

4.3.2.2 Workers to transport handle and dispose ACM wastes.

Part V

Implementation, monitoring, evaluation and funding sources

5.1 Implementation

5.1.1 Management Framework

The National Strategy on the Elimination of ARD has become a guideline of the implementation of concerned sectors, ministries from central to local levels. The national committee on the elimination of ARD will be established which includesthe representatives of concerned stakeholders to manage, implement and assess the indicated program. The Chairman of the Committee is the Vice Minister of the Ministry of Health that supervises on Hygiene and Health Promotion. The coordination office and the secretariat will be located at the Department of Hygiene and Health Promotion (DHHP), MOH. The head of the Secretariat is the Deputy Director of the DHHP that supervises on Hygiene, Environmental and Worker Health Management. The Deputy Head of the Secretariat is the Head of Division of Hygiene, Environmental and Worker Health Management.The member of the committee are the representatives of concerned ministries (Labour Management Department, MOLSW; Industry and Handicraft Department, MOIC; Pollution Control Department, MONRE; National Center for Environment and Water; Tax Department, and VAT Department, MOF; and Lao Federation of Trade Union and representatives of Cancer Doctors of Central hospitals).The main roles of the secretariat are to coordinate and consolidate reports from the localities, including development of the annual plan and monitoring the implementation of the strategy and program.

5.1.2 National coordination mechanisms

The coordination mechanism with all concerned stakeholders at all levels must be developed by having the coordination officeof the Secretariat of the National Committee for the Elimination of ARD located at the Division of Environmental and OccupationalHealth Management,DHHP as the core coordination body to implement the strategy and program together.

5.1.3 Coordination at the provincial and district levels

The ARD Committee at provincial level should be established and chaired by the Director General of Provincial Health Division. Its structure, member, roles and responsibilities of the provincial committee, including its secretariat aresimilar to the national committee on the elimination of ARD.

5.1.4 Implementation Methodologies

The implementation of the National Strategy on the Elimination of ARD is focusing on the objectives, indicated outcomes by working together with concerned stakeholders for sustainabledevelopment, promote sustainable-healthy workplaces/corporations, capacity development for stakeholders and partners, including effective support.

5.2 Monitoring and Evaluation

The national committee and the secretariat monitor,inspect andevaluate the key indicators that are indicated in each objective, outputs and outcomes including the development of standardized and appropiate tools for monitoring, inspecting and evaluating. The key indicators tomeasurethe achievement of implementation of the program and implementation plan are indicated in Table 1 in the appendix 1. The annual review and planning workshop with concerned stakeholders will be held in October of each year to reviewresults and exchange the experience on the implementation and develop the annual plan for the next year. After the annual review and planning workshop; and before the next transaction of the next year occurred, the Secretariat shall coordinate and compile information from all concerned stakeholders as below:

1. Annual report.
2. Details of expenditure report of implemented activities.
3. Details of annual plan for the next year

By the end of 2020, the program assessment should be undertaken to assess the progress of the implementation based on the plan before the next five year implementation plan.

5.3 Funding sources

To achieve the indicated goal, objectives and outcomes, the workshop on dissimination of the National Strategy on the Elimination of ARD 2018-2020 and annual planning workshop 2018 will be held for each level after this strategy had been approved to raising awareness about this strategy, national plan of action and detailed activities indicated in this plan; and to ensure that all concerned stakeholders including development partners (donors) haveclear understanding and provide funds to supportthe implementation of this plan.The secretariat will coordinate with concerned stakeholders to develop detailed plans and budgets for the implementation of concerned stakeholders as agreed in the annual operational plan. All funds received from both the government and the international organizationsdonors will follow the financial accounting system. The monetary checking system must be made once a year by an external auditor who has been approved by the donor and the secretariat. The auditing should be carried out before the next payment is made.

Part VI: Five year national strategic plan from 2018-2022

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020	2021	2022				
1. Key Strategy Action 1: Set up the national committee and focal points to promote proper informationand health education											
Objectives: 1. To set up the national committee (including key relevant ministries) with clear roles and responsibilitiesto promote the elimination of ARD and total ban of asbestos. 2. To strengthen the collaboration, coordinationand cooperation with relevant organizations and ministries. 3. To increase awareness raising and communication among workers and public people on the prevention and control of ARDs for elimination of ARD.					**Stop using Asbestos and ACM in December 2020**						
Outcomes	**Main Activities**										
1. The national committee and focal points have been established from the central to local level to promote the elimination of ARD	1.1. Set up the national committee and focal points with clear roles and responsibilitiesto promote the elimination of ARD and total ban of asbestos	The national committee and focal points have been approved by June 2018	**Q2**					**Relevant Organizations**	**DHHP**	**Secretary**	**0**

Details		Indicator	Timeline						Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
	1.2. Coordination office with the qualified staff and sufficient equipment	The coordination office is set up at the DHHP and approved by end of June 2018	**Q2**							ภอส	ภอเวอา	**10**
	1.3. Identified the coordination and reporting mechanism for the committee and implementing team	The coordination and reporting mechanism have been endorsed by end of June 2018	**Q2**							**DHHP**	**Secretary**	**0**
	1.4. The committee and team organize regular meeting to implement activity plans related to ARD elimination and to monitor the progress of the project performance.	Committee and implementing team meet 2 times per year							**Committee and its members**	**DHHP**	**Secretary (Sec.)**	**5**
2. Committee and relevant organizations have knowledge and understanding about ARD prevention and control and exchanged lessons	2.1 Organize the workshop to increase skills and knowledge on ARD prevention and control for committee, implementing teams	Organize meeting 2 times a year	**Q3**	**Q3**	**Q3**		**Q3**	**Q3**	**Relevant Dept**	**LPB, Bolikham-xay and Champa-sack**	**Sec.**	**30**

Details		Indicator	Timeline						Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
learned and experiences on ARD in the national, regional and international levels.	in all levels (district and provincial teams)											
	2.2 Organize training/ information sessions on control of asbestos exposure for companyrepresentatives, workers and villagers in the communities nearby factories including OSH staff	**Organize training 3 times a year**	**Q4**	**Q4**	**Q4**		**Q4**	**Q4**	**Owner of factory and OSH staff**	**9 target provinces**	**Technical team**	**30**
	2.3 Participate in the workshop, seminar and exchange experiences including study visits (overseas) about the implementation of this strategy and NAP on elimination of ARD in the regional and international levels	At least 3 ppl (persons?) participate in overseas workshop/seminar/training 2 times a year; 5-20 ppl joining the domestic workshop; and 10 ppl exchange study 1 time per year				**Stop using asbestos and ACM by**			**Committee and Sec.**	**Overseas**	**Sec.**	**70**
	2.4 Organize annual	Annual review	**Q4**	**Q4**	**Q4**		**Q4**	**Q4**	**Relevant Dept**	**Targeted**	**Sec**	**50**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020	2021	2022				
	review and planning meeting with concerned sectors	and planning meeting organized in October every year.						**and entrepreneurs**	**provinces**		
3. Extensively disseminate information and communication about prevention and control measures from ARD to workersand community	3.1 Produce campaign & IEC materials related ARD prevention to disseminate various information	IEC materials will be distributed to all provinces.						**workers and villagers**	**DHHP and target provinces**	**Sec.**	**63**
	3.2 Develop and print out handbook about impact ARD	Handbook has been endorsed by end of 2018	**Q4**					**Workers, villagers and staff**	**DHHP**	**Sec.**	**7**
	3.3 Broadcasting information through media: radio, TV, newspaper programs, mass organizations, online website about impact of Asbestos	At least xx information is broadcasting through radio, TV and newspaper once a week in the 1st year, once a month in the next year						**Workers, villagers and staff**	**Central and provinces**	**Sec.**	**30**
	3.4 Organize campaign activities during the national dayand traditional festival	Organize campaign activities during the national	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**villagers**	**Central and provicial levels**	**Sec.**	**20**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020	2021	2022				
	events, e.g., set up campaign booths, distribute magazines, shirts, bags, fans and others.	dayand traditional eventssuch ascampaign booths 2 times a year									
1. Key Strategy Action 2: Develop policy, decision and principles on the ban of Asbestos											
Objectives: 1. To stop using asbestos for all sectors of productions including stop importing,distributing, and sales ofall ACM products in Laos. 2. To review, develop and enforce laws and regulations that are related to the ban of ARD in relevant organizations, and ministries such asinternational conventions, national decrees, laws, decisions, agreementsandother international standards 3. To encourage companies, publicand other relevant organizations to use alternative substitutes and asbestos free materials to produce roof-sheets including to ceaseimporting and distributing ACM materials.											
Outcomes	**Main Activities**										
1. Review legislations and standards that	1.1 Gather and consolidate legislations and regulations related to	Gather and consolidate legislations and	**Q3**					**Relevant Dept**	**DHHP**	**Sec.**	**0**

Details		Indicator	Timeline						Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
are related to Asbestos with other relevant organizations and ministries	asbestos from different relevant organizations	regulations from different relevant organizations by end of June 2018										
	1.2 Organize a consultation workshop with concerned organizations and ministries to review registrations and standards related to asbestos.	Consultation workshop with relevant department and ministries by end of 11 2018	**Q4**						**Relevant Dept**	**DHHP**	**Sec.**	**5**
2. The legislationand regulation have been developed and endorsed by relevant departments and ministries	2.1 Organize workshop on the discussion of ILO convention No. 162 with the regard to Asbestos	Organize workshop on the discussion of ILO convention in 6 2018	**Q3**						**Dept of Labor**	**Dept of Labor**	**Dept of Labor**	**1**
	2.2 Develop regulation, laws and particular legislation to stop using all kinds of asbestos in Lao PDR	Relevant dept to develop draft in March 2019		**Q1**					**Relevant Dept**	**Relevant Dept**	**Relevant Dept**	**29**
	2.3 Improve the legislation of relevant sector to control asbestos exposures in all workplaces and communities to the ban of asbestos and ACM e.g: - Add more information related to asbestos into some of articles of	- OSH decree will have been endorsed by end of 2018 - Law on Hygiene and health promotion will be approved by							**Relevant Dept**	**Relevant Dept**	**Relevant Dept**	**10**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
	OSH decree - Law on Hygiene and health promotion that is being improved	end of 2019										
	2.4 A draft of environment standards that related to asbestos substance	A draft of standard for the control of asbestos exposure in environment and wastes approved by end of March 2019		**Q1**					**Dept of pollution control**	**Dept of pollution control**	**Dept of pollution control**	**5**
	2.5 Organize a consultation workshop on improving legislation and standards related to stop using asbestos and ACM with relevant ministries	Organize a consultation workshop on improving legislation in June 2019		**Q2**					**Relevant Dept**	**Relevant Dept**	**Relevant Dept**	**20**
	2.6 Submit final legislation and standard related to the ban of asbestos and ACM to upper management level to deliberate, comments and approve	Specific legislations and law of the ban all type of asbestos approved by upper level by end of 2019		**Q3**		**Stop using asbestos and ACM by 2030**			**Relevant Dept**	**Relevant Dept**	**Relevant Dept**	**5**
3. Approved legislation	3.1 The legislations and standardswill be printed	Legislations and standards will be		**Q4**					**Relevant Dept and private**	**DHHP**	**Sec.**	**20**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
related to the ban of asbestos and ACM including the standards have been distributed and enforced in relevant ministries and local organizations.	and distributed to relevant organizations	distributedto relevant organizations by end of Nov. 2019							**company**			
	3.2 Organize information sharing workshop to enforce the law and legislation to all organizations from central to local levels.	Organize information sharing workshop in Jan 2020			**Q1**				**Govt& private companies**	**Central and province**	**Sec.**	**30**
4. The entrepreneurs and concerned sectors prepare for transition to use alternative materials that are less hazardousand then to substitute the asbestos in producing the roof sheets and importing and distributing non-ACM	4.1 Organize technical consultation workshop with the entrepreneurs and concerned sectors on the use of alternative substances to produce the roof sheets or other materials.	Organize technical consultation workshop by end of Feb.			**Q1**				**Govt& private companies**	**Central and province**	**Sec.**	**20**
	4.2 Organize consultation workshops on importing, distributing and selling all materials with non-asbestos	Organize technical workshops by end of March			**Q1**				**Relevant Dept**	**Central**	**Sec.**	**10**
	4.3 Trial of non-asbestos substances and alternative materials to produce roof-sheets in some example	Trial completed in June 2020			**Q1 - Q2**				**Private**	**Central and province**	**Private**	**10**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020	2021	2022				
	factories										
	4.4 Organize consultation workshop on paying low tax, VAT during the transition period and changing technology	Three consultation workshops organized and done by June 2020			**Q3**			**State and private**	**Central and province**	**Sec**	**10**
3. Key Strategic Action 3: Setting up institutional framework, capacity building for enforcement and implementation of policy and regulatory framework on mitigation of asbestos exposure (customs inspection, samplingand testing)											
Objective: 1. To ensure sufficient technical capacity of human resource in health and related sectors in implementing and enforcement of legislativeframework for banning asbestos use including ACM 2. To develop sufficient tools, labolatory, equipment and expertise (?)for related organization in order to implement and enforce all approved legislation/regulation document.											
Outcome	**Main activities**										
1. Review, procure and provide required tools, laboratory and	1.1 Conduct meetings with stakeholders and experts to review and develop tool list, laboratory and required equipment to	The meeting will be conducted by February 2019		**Q3**				**Relatd stakeholders**	**DHHP**	**secretariat**	**5**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
equipment to implement and enforce the legislation to implementing bodies	implement and enforce the legislation document											
	1.2 Procure and provide availabletools and equipments to related organizations	Procure and provide filed tools/kid and equipment by June 2020		**Q4**	**Q2**				**Related stakeholders**	**Relatd stakeholders**	**secretariat**	**30**
	1.3 Build labolatory for asbestos fiber test in air and ACMs	Build laboratoryfor assessing asbestos fiberJune 2020		**Q4**	**Q2**				**Related stakeholders**	**Relatd stakeholders**	**secretariat**	**50**
2. Strengthen technical capacity and experience sharing for Health and other concerned sectors staff to implement and enforcement ofregulations	2.1 Training and demonstrating on how to use tools and equipments	**Training 25 participants (50% female)**			**Q3**				**Related stakeholders**	**Relatd stakeholders**	**expert**	**5**
	2.2 Strengthen technical capacity and exchange study in other country on the implementation and enforcement of the regulations(example: tools and equipment to test import product/materials at the border check-points, and demolishing sites)	At least 2 times of international experience sharing for 10 staff (50% female)			**Q2**				**Related stakeholders**	**Relatd stakeholders**	**secretariat**	**30**
4. Key Strategic Action 4: Establishing monitoring, evaluation and ARD disease surveillance framework including to update National Asbestos Profile, collecting and												

Details		Indicator	Timeline						Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
sharing data and information on ACMs, its imports, production and volume of asbestos containing wastes												
Objectives: 1. To develop monitoring framework, evaluation, disease surveillance and reporting **2.** To share information on asbestos and ACM to all stakeholders **3.** To update National Asbestos Profile												
Outcome	**Main activities**											
1. Monitoring, Evaluation and Surveillance Frameworks, including reports, have been formulated and used consistently.	**1.1 Draft** monitoring framework, evaluationand disease surveillance including reporting	**The draft completed by October 2018**	**Q4**							**DHHP**	**secreteriat**	**0**
	1.2 **Stakeholder consultation meeting on** monitoring framework, evaluationand ARD disease surveillance including reporting	**3 times Stakeholder consultation meeting with 20 participants (50% female)**	**Q4**						**TWG**	**DHHP**	**secreteriat**	**15**
	1.3 Printing and dissemination on monitoring, evaluation and ARD disease surveillance framework including reporting	**3 times dissemination meetings for 90 participants (50% female)**	**Q4**							**Central and provincial**	**secreteriat**	**15**
	1.4 Training on ARD disease surveillance (epidemiology, health risk evaluation caused by	**2 Trainings per year with 30 participants each (50%**	**Q4**	**Q1**	**Q2**	Stop	**Q1**	**Q2**	**Target provinces**	**Central and provincial**	**secreteriat**	**25**

Details		Indicator	Timeline						Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
	asbestos, diagnosis)	**female)**										
	1.5 Conduct ARD surveillance and permanent health examination of exposed workers before, during and after total ban 1.5.1 Develop passive and active ARD surveillance and history of employement and exposure template 1.5.2 Colectdata using template for hospitals and factories 1.5.3 Input data, analysis and report to the committee and the secretariat	Conduct surveillance activity 2 times for 16 factories and nearby communities (15 ppl participate each time)							**Target provinces**	**Central and provincial**	**TWG**	**40**
2. Monitoring and testing the import of asbestos and ACM from related organizations (tax dept and commercial dept) is conducted regularly and	2.2 Develop and test monitoring template, audit and reporting of the tax dept and commercial dept	Test monitoring template, audit and reporting at 2 border-check points	**Q4**							**stakeholders**	**stakeholders**	**3**
	2.2 training on monitoring template, audit and reporting	**2 trainings with 30 participants each (30% female)**		**Q1**					**Central and Provincial stake holders**	**stakeholders**	**stakeholders**	**15**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
continuously	2.3 Conduct monitoring, auditing logbook and data entry into digital system	Monitoring and auditing anytimes							**Central and Provincial stake holders**	**stakeholders**	**stakeholders**	**30**
	2.4 Analyse and report the situation to the committee and secretariat	Report to the committee monthly							**Central and Provincial stake holders**	**stakeholders**	**stakeholders**	**0**
3. Review and update the National Asbestos Profile and share to concerned stakeholders	3.1 Collect data from concerned stakeholders	Data collection is conducted by the technical team							**Central and Provincial stake holders**	**stakeholders**	**secreteriat**	**5**
	3.2 Draft the updated version of National Asbestos Profile to reflectlatestsituation	**The draft is share with the committee by mid of June 2019**							**Central and Provincial stake holders**	**stakeholders**	**secreteriat**	**0**
	3.3 Stakeholder consultation meeting	Conduct Stakeholder consultation meeting with participation of the committee and TWG members							**stakeholders**	**stakeholders**	**secreteriat**	**3**
	3.4 Send the final updated draft of national asbestos profile to high level for approval	**The updated profile approved by October 2019**									**secreteriat**	**0**
	3.5 Printing and disemminate the profile	**Dissemination meeting with 60**							**Central and Provincial**		**secreteriat**	**13**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
		participants (30% female)										
5. Key Strategy Action 5: Safe removal of ACMs or demolition ofthe building materials/house that have high level of ACM, and protection of worker's safety and waste management of ACM.												
Objective: **1.** To increase the capacity, raising awareness and experience for concerned sectors on safe removal or demolishingof the building, home that have ACM. **2.** Concerned sectors know-how to protect themselves and workers and also to prevent contamination of the environment												
Outcomes	**Main activities**											
1. The knowledge and skills of concerned sectors whose working on removalor demolishingACM building had been improved. IMPORTANT: "Construction is intentionally omitted becausethe new	1.1 Develop or improve the legislation of removal and demolition process, requirements for special permission is given to a company can safely remove asbestos	The legislation had been approved by high level by end of Feb. 2019		**Q1**		Stop using asbestos and ACM by 2030				**Home and urban planning dept.**	**Home and urban planning dept.**	**5**
	1.2 Issue the Recommendation/SOPs on the implementation of removal and demolition	The recommendation had been endorsed by end of Mar 2019		**Q1**						**Home and urban planning dept.**	**Home and urban planning dept.**	**5**
	1.3 Identify the organizations	List of the	**Q4**							**Home and**	**Home and**	**0**

Details		Indicator	Timeline						Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
use of asbestos/ACM as construction materials should be prohibited.	or the removal/ demolitioncompanies and mandatory training for workers on safe removal process	company has been sent to the committee in Oct 2018								**urban planning dept.**	**urban planning dept.**	
	1.4 Technical workshop on safe removal and demolitionof the building and homes for concerned sector ateach level	Conduct 3 times, total participant 90, 30% females		**Q1**					**Companies at central and provincial level**	**central and provincial level**	**Home and urban planning dept.**	**25**
	1.5 Exchange study on safe removal and demolish the building and home with some countries	At least 2 times. 10 ppl each time		**Q2**			**Q2**		**Home and urban planning dept.**	**Abroad**	**Secretariats**	**20**
2. Many organisations or companies that areresponsiblefor, removal and demolishingthe building and homes have got a certificate from concerned ministry IMPORTANT: Construction (using asbestos or ACM) should be	2.1 Register the organisation or companies those respond for removaland demolition ofthe building and homes	**Send the list of organisations or companies which have been registered to committee by end of Apr. 2019**		**Q3**					organisations or companies	**Home and urban planning dept.**	**Home and urban planning dept.**	**0**
	2.2 Issued certificates on removal and demolition ofbuildings and homes for the organisations or companies	At least 30 certificates had been issued per year		**Q3**	**Q3**		**Q3**	**Q3**	organisations or companies	**Home and urban planning dept.**	**Home and urban planning dept.**	**0**
	2.3 **Monitor and evaluate organizations or companies that removed**	**Monitor and evaluate everytimes when**							organisations or companies	**Home and urban planning**	**Home and urban planning**	**30**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
omitted. "Replacement" with non-asbestos is OK but not new construction.	**or demolished buildings and homes**	**the organizations or companies demolish or destroy ACM buildings and homes**								**dept.**	**dept.**	
	2.4 **The workshop to exchange lessons learned with all concerned with the removal and demolition of buildings and homes.**	**Conduct exchange workshop once per year in Nov.**			**Q4**		**Q4**	**Q4**	organisations or companies	**Home and urban planning dept.**	**Home and urban planning dept.**	**15**
	2.5 **Consultation workshop to discuss about Safety and health measurement, including control of ACM removal.**	**Around 30 ppl attending the workshop**	**Q4**						**Worker and community**	**Home and urban planning dept.**	**Home and urban planning dept.**	**3**
3. Workers and community living around the removal site or doing self-removal at home becomes aware of safe removal to protect themselves	**3.1 Advocate about** safe removal and demolition ofthe buildings and homes	**2 workshops per year with 40 ppl**							**Worker and community**	**Home and urban planning dept.**	**Home and urban planning dept.**	**15**
	3.2 Consultation workshop on drafting the Guidelines for the safe management of ACM wastes	**3 workshops with 70 ppl (30% females)**		**Q1**					**Worker and community**	**Pollution Control Dept.**	**Pollution Control Dept.**	**15**
	3.3 Advance notice to the workers and community	**Monitoring by the technical**							**Worker and community**	**Removal site**	organisations or companies	**0**

Details	Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
		2018	2019	2020		2021	2022				
living around the ACM removal or demolitionarea	**team**									
3.4 Identify or develop safe removal system to prevent human exposure and contamination of environment.	**The protection system has been inspected by Technical team**							**Worker and community**	**Removal site**	organisations or companies	**0**
3.5 Develop IEC materials for community advocacy on control measures of ACM. IMPORTANT: please avoide stating "deal with asbestos safely" as it creates misunderstanding	**3,000 sheets of posters and leaflets to distribute to target provinces per year**	**Q4**						**Worker and community**	**DHHP**	**Secreteriats**	**25**
3.6 Instructthe workers to wear respirators and dustmasks combined with other personal protection equipment (PPE) during working with asbestos removal	**Respirators and Dust Masks and other PPEshave been inspected by Technical team**				**Stop using asbestos and ACM by**			**Worker**	**Removal site**	organisations or companies	**0**
3.7 Regularly inspect, measure asbestos fiber in dust during asbestos removal process and waste handling/disposal process and report on	**The inspection and measurement report had been sent every time it is demolished**							**Worker and community**	**Removal site**	**Pollution Control Dept.**	**15**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020	2021	2022				
	asbestos contaminationofthe air to concerned sector and the secreteriats committee										
6. Key Strategy Action6: Improving capacity for diagnosis, treatment, pallativecareand careof disabled people in combination withcompensation for ARD patients											
Objective: 1. To improve the capacity of public health staff to be able to diagnose, treat and palliative care forthe ARD patient. 2. To compensate for ARD patients fairly and sustainably											
Outcomes	Main activities										
1. The capacity of medical doctorsto diagnose and treat ARD has been improved	1.1. Improving the medical committee on diagnosis and certificationof occupational diseases compensation	Conduct the workshop 3 times, once a year in Apr.	Q3		Q3		Q3	committee	DHHP	Secreterials	3
	1.2 Upgrade skills of medical doctors in diagnosis and treating ARD via overseas training for short, medium and long term.	15 Medical staffs and nurses were upgraded per year, 30% female						Medical staffs and nurses	Abroad	Secreterials	50
	1.3 Develop a handbook on	The handbook	Q4					Worker	DHHP	Secreterials	8

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020	2021	2022				
	Health Check (periodic and permanent health examination guide) - Before, During, and After Work exposure	was approved and used by the end of November 2018									
	1.4 Purchase and supply of medical equipment for diagnosis and treatment of the ARD to targeted hospitals (Radiology, Pathology, Oncology, Surgery)as well as Analytical Equipment for assessment and research)	medical equipment provided as planned						Central and provincial hospital	hospital	Secreterials	100
	1.5 Overseas study and exchange on ARD diagnosis and treatment	15 Medical doctorsstudyabroad per year, 30% female		Q4	Q4	Q4	Q4	Medical staffs and nurses	Abroad	Secreterials	30
2. The capacity of medical staff in particularnurses in careof ARD patientsparticular	2.1. Upgrading medical staff in particularnurses in careof ARD patients - short, medium and long term domesticallyand overseas.	10 Medical staffs and nurses were upgraded per year, 30% female		Q4	Q4	Q4	Q4	Medical staffs and nurses	Abroad	Secreterials	30
	2.1 Purchasing and supplying medical	medical equipment						Rehabilitation center	Rehabilitation center	Secreterials	50

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
palliativecare has been improve	equipment for palliative careof ARD	provided as planned										
	2.2 Exchange study abroad on palliative careof ARD patients	10 Medical staff and nurses study abroad per year, 30% female		Q4	Q4		Q4	Q4	Medical staffs and nurses	Abroad	Secreterials	20
3. ARD patients receivedcompensationfairly and sustainably	3.1.Medical committee for diagnosisand certification ofoccupational diseases compensation and members to participate ;study or conference abroad on ARD diagnosis and assess the level of occupational disability	3 ppl each year		Q4	Q4		Q4	Q4	Committee	Abroad	Secreterials	10
	3.2 Improve the handbook on assessment of labor ability	Improved by Dec. 2018	Q4						Worker	Treatment Dept.	Treatment Dept.	5
	3.3 Publishing statistics on ARD compensation	6 times per year							Concerned sector in each level	LabourMnt. Dept.	LabourMnt. Dept.	20
	3.4 Workshop to research and discuss about ARD diagnosis and estimate the percentage of Disability.	Conduct meeting at least 4 times per year		Q1	Q1		Q1	Q1	Worker	Central and provincial	Secreterials	15

Stop using asbestos and ACM

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
	3.5 Issue the certification for ARD patients to receivethe compensation	**The certificate for compensation was checked by the technical team when they conduct monitoring visit**							**Worker / ARD victims**	**Central and provincial**	**Secreterials**	**0**
	3.6 The National Social Security Office assessedcompensationsystem for ARD patients/victims	**Compensating procedure was checked by the technical team when they conduct monitoring visit**							**Worker / ARD victims**	**Central and provincial**	**Social Security office**	**0**
7. Key Strategy Action7: Carry out a research on ARD surveillance and develop the curriculum for teaching in the university												
Objective: 1.To promote the use of disease surveillance data and research to develop understanding and decision-making based on evidence. 2.To ensure that research involving multi-sectoral related to health impacts of asbestos is identified and endorsed by a partner.						**Stop using asbestos and ACM**						
Outcomes	**Main Activites**											
1. The National Academic Research on	1.1 Planning workshop with concerned sectors	2 times with 50 ppl, 30% females	**Q4**				**Q4**		**University and concerned sectors**	**DHHP**	**Secretariats**	**5**

Details		Indicator	Timeline					Target groups	Location	Responsible organization	Required budget (x 1000 US$)
			2018	2019	2020		2021	2022				
the Relations between asbestos and Health has been developed and implemented.	1.2 Proceed the research by university and concerned sectors	At least 3 topics per year							**Worker and community**	**Central and provincial**	**University and concerned sectors**	**70**
	1.3 **Dissemination workshop to present the findings of research and use the database to develop a national profile, national strategic plan and NAPEARD**	Once every year with 70 ppl, 30% females		**Q3**	**Q3**		**Q3**	**Q3**		**DHHP**	**Secretariats**	**20**
2 The topic of asbestos impact to health was integrated in the OHS of worker curriculum for teaching and training at schools and universities.	2.1 Consultation workshop with schools and university to develop training curriculum	1 time with 30 teachers, 30% females	**Q4**						**students**	**DHHP**	**Secretariats**	**1**
	2.2 Conducting training on the impact of asbestos to health for teacher from medical and pulic health schools and health sciences university	2 times per year x 30 teachers, 30% females		**Q1**	**Q1**				**Teachers**	**Central and provincial**	**Secretariats**	**15**
	2.3 Training on the impact of asbestos to health for students from medical schools and university	Asbestos subject was monitored during the courses							**students**	**Central and provincial**	**Secretariats**	**0**
	2.4 Assessment of the training and teaching	The training and teaching assessment was aboved70%							**students**	**Central and provincial**	**Secretariats**	**10**

Compile the required budget each year (US$)

No.	Key Strategy Action	Outcomes	Required budget (x 1000 US$)					
			2018	2019	2020	2021	2022	Total
1	**Key Strategy Action 1: Set up the national committee and focal points to promote understanding and health education**	1.1 The national committee and focal points have been established from the central to local level to promote the elimination of ARD	3	3	3	3	3	15
		1.2 Committee and relevant organizations have knowledge and understood about ARD and exchanged lesson learned and experiences on ARD in the national, regional and international levels.	36	36	36	36	36	180
		1.3 Extensively disseminated information and communication about ARD to workersand public	24	24	24	24	24	120
		Total	63	63	63	63	63	322
2	**Key Strategy Action 2: Develop policy, decision and principles on the ban of Asbestos**	2.1 Review legislations and standards related to Asbestos with other relevant organizations and ministries	1	1	1	1	1	5
		2.2 The legislationand regulation have been developed and endorsed by relevant departments. and ministries	14	14	14	14	14	70
		2.3 Approved legislation related to the ban of asbestos and ACM including the standards have been distributed and enforced in relevant ministries and local organizations.	10	10	10	10	10	50
		2.4 The companiesand concerned sectors prepare for transition to use alternative materials that are less hazardousand then to substitute the asbestos in producing the roof sheets and importing and distributing non-ACM	10	10	10	10	10	50
		Total	35	35	35	35	35	175
3	**Key Strategic Action 3: Setting up institutional framework, capacity building for**	3.1. Review, procure and provide required tools, laboratory and equipment to implement and enforce the legislation to related implementing	17	17	17	17	17	85

	enforcement and implementation of policy and regulatory framework on mitigation of asbestos exposure (custom inspection, sampling and testing)	bodies						
		3.2. Strengthen technical capacity and experience sharing for Health and other concerned sectors staff to implement and enforcement regulations	7	7	7	7	7	35
		Total	24	24	24	24	24	120
4	**Key Strategic Action 4: Establishing monitoring, evaluation and disease surveillance framework including to update National Asbestos Profile, collecting and sharing data and information on ACM, its imports, production and volume of asbestos containing wastes**	4.1 Monitoring, Evaluation and Surveillance Frameworks, including reports, have been formulated and used consistently	19	19	19	19	19	95
		4.2 Monitoring and testing the import of asbestos and ACM from related organization (tax departmentand commercial department) is conducted regularly and continuously	9.6	9.6	9.6	9.6	9.6	48
		4.3 Review and update the National Asbestos Profile and share withconcerned stakeholders	4.2	4.2	4.2	4.2	4.2	21
		Total	32.8	32.8	32.8	32.8	32.8	164
5	**Key Strategy Action 5:** Safe removal or demolish the building, home that have ACM, worker's safety and waste management of ACM	1.1 The knowledge and skills of concerned sector that's working on removal or demolition ofACM building had been improved.	11	11	11	11	11	55
		1.2 Many organisations or companies that are responsible for, removal or demolition of the building and homes have receoveda certificate from the concerned ministry	9.6	9.6	9.6	9.6	9.6	48
		1.3 Worker and community living around removal site or self removal at home be aware of safe removal to protect themselves and also to prevent contamination of the environment.	11	11	11	11	11	55
		Total	31.6	31.6	31.6	31.6	31.6	158
6	**Key Strategy Action 6: Improving capacity for**	**6.1 The capacity of medical doctors to diagnose and treatARD has been improved**	38.2	38.2	38.2	38.2	38.2	191

	diagnosis, treatment, and careof disabled people in combination withcompensation for ARD patients	**6.2 The capacity of medical staff and nurses in palliative careof ARD patients has been improved**	20	20	20	20	20	100
		6.3 ARD patients receivedcompensationfairly and sustainably	10	10	10	10	10	50
		Total	68.2	68.2	68.2	68.2	68.2	341
7	**Key Strategy Action7: Carry out a research on ARD and develop the curriculum for teaching in the university**	7.1 The National Academic Research on the Relations between asbestos and Health has been developed and implemented	19	19	19	19	19	95
		7.2 The topic of asbestos impact onhealth was integrated in the OHS of workers' curriculum for teaching and training at schools and universities	5.2	5.2	5.2	5.2	5.2	26
		Total	14.2	14.2	14.2	14.2	14.2	121
		Total Required Budget	268.8	268.8	268.8	268.8	268.8	1,402

Minister of Health

Annex
Table 1:

Indicators related to the Impacts outcomes; process and administration need to be developed and answered the following questions:

1. Outcome impact indicators	1.1Did we achieve the key outcomes which develop from the prevention program?
	1.2 Did the risk of asbestos exposure decrease by asbestos banning?
	1.3 Was the dust control technology applicable?
	1.4 Has the ARD surveillance system been developed?
	1.5 Did asbestos Consumption per year decrease?
	1.6 Has number of the workers exposed to asbestos been reduced?
	1.7 Has thenumber of ARD been estimated?
	1.8 Haslevels of public awareness improved regardinghealth risks from the use of asbestos?
2.Process indicators	2.1 Haveactivities or campaigns been implemented to support the prevention?
	2.2 Have there been sufficienttraining, information dissemination, professional certification (e.g. laboratory, OHS officer, radiation analysis byusing ILO 2000 system)? 2.3 Have the quality and quantity of inspection, workplaces inspection been improved?
	2.4 The numberof doctors that have been trained onARD diagnosis, treatment and surveillance
	2.5 The percentage of workers exposedto asbestos who are covered by medical surveillance?
	2.6 The number of labor inspectors and professionals from occupational health services trained in risk assessment and management of asbestos exposures
	2.7 The number of workers and employers trained in prevention of asbestos-related diseases
	2.8 The existenceof national registry of workers exposed to asbestos
	2.9 The existenceof systems for authorization of works involving asbestos
	2.10 The number of enterprises signing up to voluntary initiatives to reduce and eliminate the use of asbestos
3. Administration indicators	3.1 Is the program coordination and administration effective and efficient?
	3.2 The number of meetings of the Multi-Sectoral Committee

	per year
	3.3 The numberof meetings of the Asbestos Technical Working Group per year
	3.4 The average level of attendance tomeetings
	3.5 The rate of financial implementation
	3.6 The percentageof activities completed by the deadline

Table 2: GBD2016 Estimates of ARDs Deaths in 2016 (number of deaths)

Rank	Country	Total	Occupational exposure to asbestos						Mesothelioma (observed)	% of Occup	LC/ Meso	Asbestosis (observed)
			Total	Mesothelioma	Lung cancer	Ovarian cancer	Larynx cancer	Asbestosis				
		B+C+D+F+G	A+B+C+D+E	A	B	C	D	E	F	A/F	B/A	G
1	United States	39,395	39,275	3,161	34,270	787	443	613	3,282	96.3%	10.84	613
2	China	21,510	20,940	2,178	17,971	270	198	323	2,747	79.3%	8.25	323
3	United Kingdom	18,063	18,036	2,837	14,056	760	174	209	2,864	99.1%	4.96	209
4	Japan	16,648	16,591	1,449	14,529	189	105	320	1,506	96.2%	10.03	320
5	Italy	15,422	15,394	1,699	12,810	488	297	101	1,727	98.4%	7.54	101
6	Germany	15,278	15,242	1,729	12,613	509	193	199	1,765	98.0%	7.29	199
7	France	12,508	12,481	1,546	10,083	379	215	257	1,573	98.3%	6.52	257
8	India	7,565	7,136	1,976	4,018	144	517	482	2,405	82.2%	2.03	482
9	Canada	5,911	5,896	648	5,031	89	67	61	663	97.8%	7.76	61
10	Spain	4,952	4,932	494	4,137	108	121	71	515	96.0%	8.37	71
11	Russia	4,843	4,776	624	3,716	294	113	29	691	90.2%	5.96	29
12	Netherlands	4,671	4,664	639	3,845	122	45	13	647	98.9%	6.02	13
13	Turkey	4,282	4,250	507	3,573	65	83	22	539	94.1%	7.04	22
14	Australia	4,058	4,048	766	3,017	140	48	77	776	98.7%	3.94	77
15	Brazil	3,528	3,441	691	2,417	129	139	64	778	88.8%	3.50	64
16	Poland	2,930	2,913	234	2,510	95	61	12	251	93.2%	10.74	12
17	Belgium	2,799	2,794	278	2,391	65	34	25	283	98.3%	8.60	25
18	Vietnam	2,038	2,000	127	1,834	11	23	5	165	77.3%	14.40	5
19	South Africa	1,839	1,823	280	1,338	35	54	117	296	94.6%	4.78	117
20	South Korea	1,780	1,760	117	1,586	18	15	24	138	85.0%	13.50	24
21	Iran	1,666	1,630	363	1,162	10	84	11	399	91.0%	3.20	11
22	Argentina	1,597	1,580	202	1,255	58	39	26	219	92.3%	6.22	26
23	Bangladesh	1,572	1,525	137	1,319	5	37	27	183	74.7%	9.64	27
24	Thailand	1,556	1,522	222	1,255	10	31	4	255	86.8%	5.66	4
25	Ukraine	1,364	1,344	309	825	178	25	7	329	93.9%	2.67	7
26	Switzerland	1,276	1,273	203	1,015	36	16	3	206	98.3%	5.01	3
27	Denmark	1,265	1,263	131	1,061	47	13	10	134	98.2%	8.07	10
28	Mexico	1,167	1,123	323	690	53	33	24	366	88.1%	2.14	24
29	Sweden	1,161	1,157	173	898	63	10	13	177	97.7%	5.20	13
30	Myanmar	1,131	1,108	166	798	117	25	3	188	87.9%	4.81	3
31	Greece	1,098	1,093	79	967	27	19	2	83	94.5%	12.25	2
32	Indonesia	1,088	984	337	556	47	29	15	440	76.5%	1.65	15
33	Austria	946	942	118	769	41	12	3	121	96.9%	6.54	3
34	Pakistan	873	819	158	537	32	60	31	212	74.6%	3.40	31
35	Taiwan	766	756	52	677	5	8	14	62	83.8%	13.00	14
36	Finland	763	760	103	602	29	6	20	106	97.9%	5.83	20
37	Croatia	747	745	67	637	16	19	6	69	97.3%	9.55	6
38	Norway	645	643	80	527	23	5	8	82	97.7%	6.60	8
39	Philippines	643	605	105	471	13	9	7	142	73.5%	4.50	7
40	New Zealand	610	609	97	478	16	7	10	99	98.3%	4.91	10
41	Portugal	560	556	63	460	13	14	6	67	93.4%	7.32	6
42	Romania	545	536	62	436	22	14	2	71	87.4%	7.03	2
43	Hungary	510	506	35	444	16	9	1	40	88.9%	12.51	1
44	Czech Republic	494	489	47	414	21	6	2	51	91.1%	8.84	2
45	Ireland	454	453	44	389	10	6	4	46	96.5%	8.82	4
46	North Korea	414	404	34	354	5	3	8	45	77.2%	10.29	8
47	Colombia	397	380	83	265	13	12	7	100	83.1%	3.18	7
48	Serbia	391	388	32	338	8	9	1	36	88.9%	10.71	1
49	Israel	381	378	45	310	16	5	2	48	94.2%	6.89	2
50	Chile	363	355	58	279	9	6	3	66	89.1%	4.77	3
51	Ethiopia	354	330	99	174	31	13	13	123	80.7%	1.75	13
52	Egypt	315	290	98	157	17	7	11	123	79.7%	1.60	11
53	Slovenia	262	261	30	214	9	4	5	30	97.1%	7.24	5
54	Malaysia	259	248	29	210	4	4	1	40	72.7%	7.25	1
55	Afghanistan	252	244	67	153	15	7	2	75	89.3%	2.29	2
56	Peru	244	234	52	160	12	5	5	62	84.1%	3.08	5
57	Kazakhstan	243	237	35	175	13	4	10	41	85.2%	4.94	10
58	Morocco	225	214	53	139	12	7	3	64	83.6%	2.61	3
59	Belarus	221	217	33	162	16	5	1	37	89.2%	4.98	1
60	Iraq	215	205	41	150	3	8	3	51	80.2%	3.63	3
61	Cuba	208	203	17	174	2	9	1	22	77.0%	10.51	1
62	Sri Lanka	202	193	71	110	7	4	1	80	89.1%	1.55	1
63	Democratic	190	175	53	99	10	5	8	68	78.1%	1.86	8
64	Singapore	183	182	17	161	2	2	0	18	92.2%	9.51	0
65	Venezuela	167	157	26	119	4	5	3	36	72.7%	4.51	3
66	Tanzania	161	149	43	83	11	6	6	55	78.5%	1.92	6

67	Uruguay	149	147	12	128	3	4	1	13	89.5%	11.10	1
68	Bosnia and	147	145	9	131	1	3	1	10	83.8%	14.92	1
69	Armenia	145	144	18	116	6	3	0	20	93.5%	6.36	0
70	Nigeria	144	115	49	50	10	2	3	79	62.7%	1.01	3
71	Slovakia	144	142	14	120	4	3	0	16	85.7%	8.62	0
72	Nepal	130	123	33	72	4	7	7	41	80.8%	2.18	7
73	Cambodia	130	124	17	101	3	3	0	23	74.5%	5.99	0
74	Algeria	125	114	36	68	3	3	3	47	75.1%	1.91	3
75	Bolivia	112	109	22	74	7	3	2	26	86.9%	3.29	2
76	Tunisia	101	97	12	79	2	4	1	16	75.9%	6.70	1
77	Cyprus	98	98	12	81	3	1	1	12	97.1%	6.77	1
78	Lithuania	95	94	10	74	8	2	0	11	89.3%	7.17	0
79	Kenya	94	84	32	37	4	6	5	42	76.4%	1.14	5
80	Yemen	89	83	21	53	5	2	2	27	78.0%	2.49	2
81	Latvia	88	87	9	71	5	2	0	9	90.6%	8.25	0
82	Sudan	87	78	22	49	3	2	3	31	70.8%	2.26	3
83	Uganda	82	74	21	40	5	3	4	29	74.3%	1.88	4
84	Ecuador	80	75	19	48	5	2	2	24	77.8%	2.55	2
85	Zimbabwe	79	75	14	50	5	4	3	17	78.6%	3.65	3
86	Haiti	78	74	16	50	4	3	1	20	82.3%	3.11	1
87	Lesotho	74	74	9	55	1	3	5	10	94.3%	5.99	5
88	Angola	74	69	19	41	4	2	2	24	79.1%	2.21	2
89	Mozambique	74	68	20	38	4	3	3	25	76.9%	1.96	3
90	Luxembourg	73	73	8	62	2	1	0	8	97.2%	7.82	0
91	Cameroon	71	66	18	41	5	2	1	23	79.0%	2.28	1
92	Bulgaria	71	68	7	51	3	2	6	10	71.4%	6.92	6
93	Malta	70	70	9	57	2	1	1	9	98.0%	6.21	1
94	Albania	69	68	7	58	1	2	0	8	86.8%	7.96	0
95	Georgia	69	67	13	48	4	2	0	15	88.0%	3.65	0
96	Puerto Rico	63	62	10	48	1	2	1	11	87.6%	4.93	1
97	Ghana	61	55	23	25	4	1	1	30	78.8%	1.07	1
98	Paraguay	59	56	9	42	3	1	1	11	81.8%	4.49	1
99	Lebanon	56	54	6	42	3	1	0	8	77.9%	6.60	0
100	Zambia	54	50	15	26	5	3	2	18	79.6%	1.77	2
101	Cote d'Ivoire	52	47	19	21	5	2	1	24	78.9%	1.11	1
102	Libya	51	49	6	40	1	2	0	8	76.2%	6.47	0
103	Estonia	50	49	5	40	3	1	0	5	89.9%	8.60	0
104	Madagascar	48	43	16	17	3	2	6	21	73.6%	1.09	6
105	Botswana	48	47	8	34	0	2	3	8	92.1%	4.53	3
106	Jordan	47	45	8	36	1	1	0	10	78.7%	4.59	0
107	Saudi Arabia	45	37	10	21	4	1	2	18	55.0%	2.10	2
108	Uzbekistan	43	33	11	17	2	1	2	22	51.1%	1.56	2
109	Azerbaijan	43	39	7	29	1	1	1	11	67.7%	4.00	1
110	Papua New Guinea	43	41	8	26	1	1	5	10	79.5%	3.20	5
111	Jamaica	40	39	4	32	1	1	0	5	81.9%	7.13	0
112	Senegal	39	36	10	22	3	1	1	13	78.0%	2.10	1
113	Malawi	39	36	11	21	1	1	2	14	76.4%	1.90	2
114	Laos	38	35	6	28	1	1	0	8	70.9%	4.69	0
115	Syria	37	33	9	22	1	1	1	14	68.2%	2.30	1
116	Honduras	34	32	8	19	1	1	1	11	79.6%	2.31	1
117	Iceland	33	33	4	28	1	0	0	4	96.9%	7.47	0
118	Guatemala	31	26	9	15	0	1	1	14	63.5%	1.72	1
119	Dominican Republic	30	27	4	21	0	1	1	7	59.3%	5.22	1
120	Rwanda	29	26	8	13	2	1	1	11	76.0%	1.62	1
121	Guinea	27	25	9	12	2	1	0	12	78.8%	1.29	0
122	Burundi	27	25	9	11	2	1	1	11	78.2%	1.30	1
123	Swaziland	26	26	4	19	0	1	2	4	92.3%	5.49	2
124	Somalia	26	24	9	10	3	1	1	11	79.8%	1.07	1
125	Central African Republic	26	25	6	16	1	1	1	7	83.1%	2.73	1
126	Burkina Faso	25	21	9	9	2	0	0	13	73.8%	0.94	0
127	Costa Rica	24	22	5	15	1	1	0	7	75.7%	3.00	0
128	Panama	24	22	5	16	0	1	0	6	78.6%	3.49	0
129	Niger	23	20	7	11	1	0	1	11	69.5%	1.44	1
130	Oman	23	21	5	15	0	0	0	8	70.6%	2.75	0
131	Benin	23	20	6	12	1	0	0	9	74.8%	1.81	0
132	United Arab	23	18	7	9	0	0	2	11	62.2%	1.36	2
133	South Sudan	23	20	7	9	2	1	1	10	74.8%	1.23	1
134	Moldova	22	21	4	14	1	1	0	6	73.8%	3.34	0
135	Namibia	22	22	7	9	0	2	3	8	92.7%	1.29	3
136	Congo	22	21	6	12	2	1	1	7	83.6%	2.18	1
137	Chad	22	19	6	11	1	0	0	8	73.1%	1.86	0
138	Mali	20	17	7	7	1	0	1	10	71.8%	1.03	1
139	El Salvador	20	18	5	11	0	1	1	7	73.1%	1.98	1
140	Kyrgyzstan	17	16	3	11	1	0	0	5	68.0%	3.31	0
141	Andorra	17	17	3	13	0	0	0	3	98.9%	3.88	0
142	Togo	17	15	5	9	1	0	0	6	75.1%	1.85	0
143	Montenegro	16	16	1	13	0	0	1	1	83.2%	10.52	1
144	Bahrain	15	15	3	10	0	0	1	4	84.1%	3.43	1
145	Macedonia	15	14	1	12	0	0	0	2	64.1%	8.87	0
146	Mongolia	14	13	2	11	0	0	0	2	67.5%	6.67	0
147	Eritrea	14	13	4	6	2	0	1	6	78.1%	1.36	1
148	Sierra Leone	12	11	4	5	1	0	0	5	76.0%	1.35	0
149	Greenland	12	12	1	11	0	0	0	1	96.9%	18.37	0
150	Turkmenistan	11	9	3	6	0	0	0	5	65.5%	1.77	0
151	Kuwait	11	9	3	6	0	0	0	4	70.3%	2.08	0
152	Gabon	10	10	3	6	1	0	0	3	84.4%	2.25	0
153	Tajikistan	10	7	3	4	0	0	0	5	56.4%	1.35	0
154	TrinidadandTobago	9	9	2	6	1	0	0	2	79.0%	3.25	0
155	Nicaragua	9	7	2	4	0	0	0	4	54.7%	1.96	0

156	Mauritius	9	8	1	6	0	0	0	2	74.2%	4.57	0
157	Mauritania	8	8	2	4	1	0	0	3	75.2%	1.67	0
158	Brunei	8	8	1	7	0	0	0	1	86.2%	6.69	0
159	Liberia	7	7	3	3	1	0	0	3	75.2%	1.22	0
160	Virgin Islands, U.S.	7	7	1	5	0	0	0	1	95.5%	5.32	0
161	Guam	7	7	1	6	0	0	0	1	89.3%	11.59	0
162	Guinea-Bissau	6	6	2	3	0	0	0	2	82.3%	1.58	0
163	Fiji	6	6	2	3	0	0	0	2	85.8%	1.72	0
164	Belize	6	6	1	4	0	0	0	1	89.4%	3.81	0
165	Palestine	6	5	1	4	0	0	0	1	43.5%	6.34	0
166	Guyana	5	5	2	2	1	0	0	2	86.9%	1.08	0
167	Maldives	4	4	1	3	0	0	0	1	86.8%	2.99	0
168	Solomon Islands	4	4	1	3	0	0	0	1	81.7%	4.43	0
169	Suriname	4	4	1	3	0	0	0	1	80.5%	3.75	0
170	Timor-Leste	4	4	1	3	0	0	0	1	73.6%	3.11	0
171	The Bahamas	4	4	1	3	0	0	0	1	82.7%	3.60	0
172	Bermuda	4	4	0	3	0	0	0	0			0
173	Equatorial Guinea	4	4	1	2	0	0	0	1	80.5%	2.83	0
174	Bhutan	4	3	1	2	0	0	0	1	80.0%	1.93	0
175	Qatar	4	3	1	2	0	0	0	2	58.2%	1.74	0
176	Djibouti	3	3	1	2	0	0	0	1	79.0%	1.67	0
177	Barbados	3	3	1	2	0	0	0	1	84.7%	2.98	0
178	The Gambia	2	2	1	1	0	0	0	1	70.8%	1.33	0
179	Vanuatu	2	2	0	2	0	0	0	0			0
180	Comoros	2	2	1	1	0	0	0	1	75.8%	1.36	0
181	Grenada	2	2	0	1	0	0	0	0			0
182	Cape Verde	1	1	0	1	0	0	0	0			0
183	Tonga	1	1	0	1	0	0	0	0			0
184	Federated States of	1	1	0	1	0	0	0	0			0
185	Dominica	1	1	0	1	0	0	0	0			0
186	Saint Lucia	1	1	0	1	0	0	0	0			0
187	Seychelles	1	1	0	1	0	0	0	0			0
188	American Samoa	1	1	0	1	0	0	0	0			0
189	Samoa	1	1	0	0	0	0	0	0			0
190	Saint Vincent and the Grenadines	1	1	0	0	0	0	0	0			0
191	Kiribati	1	1	0	0	0	0	0	0			0
192	Sao Tome and Principe	0	0	0	0	0	0	0	0			0
193	Northern Mariana	0	0	0	0	0	0	0	0			0
194	Marshall Islands	0	0	0	0	0	0	0	0			0
195	Antigua and	0	0	0	0	0	0	0	0			0
	Global	224,918	222,321	27,612	181,450	6,022	3,743	3,495	30,208	91.4%	6.57	3,495

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