

Non-Communicable Diseases Watch

November 2018



衛生防護中心
Centre for Health Protection



衛生署
Department of Health

Chronic Obstructive Pulmonary Disease: An Overview

Key Messages

- ※ Chronic obstructive pulmonary disease (COPD) is a life-threatening progressive lung disease characterised by a persistent reduction of airflow resulting from chronic inflammation in the lung and remodeling of small airways.
- ※ Major but modifiable risk factors of COPD are tobacco smoking, outdoor and indoor air pollution, as well as occupational exposures to air-borne pollutants.
- ※ In Hong Kong, the Population Health Survey 2014/15 reported that 0.5% (0.6% in males; 0.4% in females) of non-institutionalised persons aged 15 and above had doctor-diagnosed COPD. The disease accounted for over 30 000 episodes of inpatient discharges and deaths in 2016 and 1 223 registered deaths in 2017.
- ※ In May 2018, the Hong Kong SAR Government launched “Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong” with a list of committed actions, pursuing to achieve the target to reduce premature mortality from non-communicable diseases, including COPD and other chronic respiratory diseases (CRDs) by 2025.
- ※ For prevention, early detection and management of COPD and other CRDs, the Government will adopt a stronger and multi-pronged approach in tobacco control; identify and initiate practicable air pollution control and air quality improvement measures; strengthen the health system at all levels for prevention, early detection and management of COPD and other CRDs; review and update drug lists and clinical protocols regularly to ensure effective treatment of COPD and other CRDs; and organise large scale and systematic health communication campaigns to encourage the public to make changes for better health (such as quit smoking).
- ※ Individuals too can contribute to the fight against COPD by avoiding tobacco and adopting healthy lifestyle practices.



邁 TOWARDS
向 2025

香港非傳染病防控策略及行動計劃
Strategy and Action Plan to
Prevent and Control NCD in Hong Kong



Target 1: Reduce premature mortality from non-communicable diseases,
including COPD and other CRDs

Chronic Obstructive Pulmonary Disease : An Overview

Chronic respiratory diseases (CRDs) refer to a spectrum of diseases of the airways and other structures of the lungs. They are among the leading causes of morbidity and mortality worldwide. Some of the most common CRDs are chronic obstructive pulmonary disease (COPD), asthma, respiratory allergies, occupational lung diseases, lung cancer and pulmonary hypertension. COPD is a life-threatening progressive lung disease characterised by a persistent reduction of airflow resulting from chronic inflammation in the lung and remodeling of small airways.^{1, 2} The Global Burden of Disease Study estimated that 3.2 million people died from COPD in 2015, with an increase of 11.6% compared with 1990. The number of prevalent COPD cases also increased by 44.2% during the same period, to 174.5 million in 2015.³ Of note, COPD tends to be under-diagnosed, especially in younger patients, never or current smokers, patients with less severe airflow limitation or lower education.⁴

Risk Factors of COPD

One of the hallmarks of COPD is an accelerated decline in lung function. In general, lung function increases with age during childhood and adolescence, and reaches the maximum at approximately 20 years of age. Lung function then plateaus and starts to decline gradually from around 35 years of

age as a feature of normal ageing.^{5, 6} However, a number of risk factors (Box 1) across the lifespan can impair normal lung growth and development, limit the maximal lung function attained, shorten the duration of the plateau phase prior to the decline with normal ageing, or accelerate the decline in lung function and lead to COPD.^{2, 6, 7} Although some of the COPD risk factors (such as advancing age or gene defect) cannot be changed, smoking and other environmental factors are modifiable.

Tobacco Smoking

While the human lung is subjected to air pollutants and irritants with each breath, tobacco smoking is the most commonly encountered risk factor of COPD. Globally, between 40–73% of COPD mortality is related to smoking tobacco.⁷ Compared with never smokers, current and ever smokers were about 3.5 times and 2.9 times as likely to develop COPD respectively.⁸ However, tobacco smoking affects not only smokers. It has been shown that 25–45% of patients with COPD have never smoked.⁹ There is also sufficient evidence supporting an association between secondhand smoke exposure and COPD development and acute exacerbation.^{6, 10} In utero exposure to maternal smoking can negatively affect foetal lung growth, leading to lung function impairment in childhood and subsequently predisposing to COPD development in adulthood.¹¹

Box 1: Major Risk Factors for COPD

Environmental Exposures

- Passive smoking
- Indoor air pollution (e.g. from burning wood, animal dung and other biofuels for cooking or heating)
- Outdoor air pollution (e.g. from fossil fuel combustion in motor vehicle emissions)
- Occupational exposure to air-borne pollutants (including dusts, chemicals, gases and fumes)

Host Factors

- Smoking
- Advancing age
- Gene defect (e.g. deficiency of the enzyme α 1-antitrypsin that protects the lung from damage)
- Respiratory infection (such as pulmonary tuberculosis*)
- Co-morbidities (such as chronic asthma*)
- Early life insults (such as in utero exposure to maternal smoking)

Note: * Tuberculosis and chronic asthma are associated with irreversible loss of lung function, but it is uncertain whether the related clinical features are phenotypically different from those of COPD.

Compared to people who had not been exposed to secondhand smoke during childhood, those who had been exposed to secondhand smoke would have 50–90% increased risk of COPD later in life.¹² Like tobacco, e-cigarettes contain toxic chemicals that affect the smoker's lung. Among adults, studies found that use of e-cigarettes could increase the risk of developing chronic respiratory diseases including COPD.¹³

Air Pollution

Apart from tobacco smoking, air pollution (indoor and outdoor) can also produce deleterious effects on the small airways and cause an accelerated decline in lung function. There is ample evidence supporting the association between high concentrations of outdoor air pollutants (especially ozone, sulfur dioxide and particulate matters) with COPD exacerbation.^{6, 14} Of 4.2 million outdoor air pollution-related premature deaths worldwide in 2016, COPD accounted for 18%.¹⁵ In low- and middle-income countries, one in four (25%) premature deaths from COPD among adults are due to exposure to indoor air pollution. Compared with women who use cleaner fuels and technologies, women exposed to high levels of indoor smoke are more likely to suffer from COPD by over 2 times. Among men, exposure to household air pollution would also nearly double that risk.¹⁶

Occupational Exposure

Occupational exposure to air-borne pollutants

(including dusts, chemicals, gases and fumes) as an important cause of COPD has been recognised for years. The population-attributable fraction for occupational exposure to COPD risk is estimated to be 15–20%.⁶ A study of 3 343 participants who were randomly selected in 12 countries with 20 years of follow-up showed that those exposed to biological dust, pesticides, gases and fumes at work had 60%, 120% and 50% higher risk of COPD respectively compared with those unexposed.¹⁷

Burden of COPD in Hong Kong

With the prevalence of daily cigarette smoking hitting 30-year low at 10.0% among people aged 15 and over in 2017,¹⁸ the Population Health Survey conducted by the Department of Health (DH) between December 2014 and October 2015 observed that 0.5% (0.6% in males; 0.4% in females) of non-institutionalised persons aged 15 and above had doctor-diagnosed COPD,¹⁹ showing a marked decrease in the prevalence from 1.4% (1.9% in males; 0.9% in females) in 2003/04.²⁰ Nevertheless, COPD exacerbations often require hospital admission. In 2016, there were over 30 000 episodes of inpatient discharges and deaths attributed to COPD in public and private hospitals.²¹ Furthermore, the disease accounted for 1 223 registered deaths in 2017, representing 2.7% of all registered death in that year.²² As shown in Table 1, morbidity and mortality attributed to COPD increased exponentially with age.

Table 1: Disease Burden of COPD

Age group	Prevalence of doctor-diagnosed COPD, 2014/15		Episodes of inpatient discharges and deaths, 2016		Registered deaths, 2017	
	Number	Rate*	Number	Rate [^]	Number	Rate [^]
44 and below	6 800	0.2	1 297	33.7	2	0.1
45–64	10 100	0.5	3 720	159.8	72	3.1
65 and above	13 000	1.2	25 783	2 216.6	1 149	94.6
Total	29 900	0.5	30 800	419.8	1 223	16.5

Notes: * Rate per 100 mid-year population of respective age group; ^ Rate per 100 000 mid-year population of respective age group.

Sources: Department of Health, Census and Statistics Department, Hospital Authority.

Reduce Premature Mortality from COPD and other CRDs

The Government of the Hong Kong Special Administrative Region is committed to protect population health and reduce the disease burden from non-communicable diseases (NCD), including COPD and other CRDs. On 4 May 2018, the Government launched “Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong” (SAP) with 9 local NCD targets to be achieved by 2025 (Box 2). The main focus of SAP is on the four major NCD (i.e. CRDs, along with diabetes, cardiovascular diseases and cancer) and four potentially modifiable behavioural risk factors (namely tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity).

It has put forward a systematic portfolio of policies, programmes and actions that Hong Kong will pursue to achieve a 25% relative reduction in risk of premature mortality (i.e. dying between ages 30 and 70) from the four NCD (including COPD and other CRDs) by 2025.²³

For prevention and treatment of COPD and other CRDs, the Government will adopt a stronger multi-pronged approach in tobacco control (including e-cigarettes); identify and initiate practicable air pollution control and air quality improvement measures (such as measures to reduce emissions from vehicles, vessels, industrial sources and power plants; pursuit of renewable energy in increasing the use of wind and solar energy in electricity generation); strengthen the health system at all levels, in particular a comprehensive primary care for prevention, early detection and management of COPD and other CRDs based on the family doctor model; review and update drug lists and clinical protocols regularly based on scientific and clinical evidence to ensure equitable access by patients to cost-effective drugs and therapies of proven safety and efficacy for treatment of COPD and other CRDs in all public hospitals and clinics; and organise large scale and systematic health communication campaigns to encourage the public to make changes for better health (such as quit smoking).²³

Box 2: 9 local NCD targets by 2025



Target 1

A 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancers, diabetes, or chronic respiratory diseases



Target 2

At least 10% relative reduction in the prevalence of binge drinking and harmful use of alcohol (harmful drinking/alcohol dependence) among adults and in the prevalence of drinking among youth



Target 3

A 10% relative reduction in the prevalence of insufficient physical activity among adolescents and adults



Target 4

A 30% relative reduction in mean population daily intake of salt/sodium



Target 5

A 30% relative reduction in the prevalence of current tobacco use in persons aged 15+ years



Target 6

Contain the prevalence of raised blood pressure



Target 7

Halt the rise in diabetes and obesity



Target 8

Prevent heart attacks and strokes through drug therapy and counselling



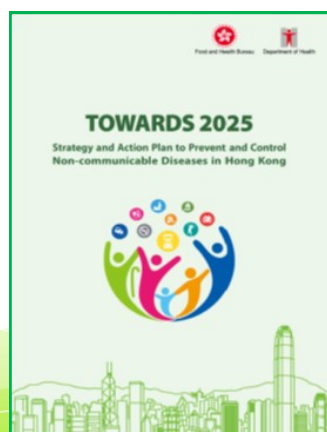
Target 9

Improve availability of affordable basic technologies and essential medicines to treat major NCD

Individuals too can contribute to the fight against COPD by keeping the lungs healthy. Key actions include:

- ✓ Do not smoke, and avoid secondhand smoke. Smokers are encouraged to call DH's Integrated Smoking Cessation Hotline 1833 183 for further information. There are a number of smoking cessation clinics run by DH and Hospital Authority. DH also subvents some non-governmental organisations, such as Tung Wah Group of Hospitals and Pok Oi Hospital to provide free smoking cessation services in the community. For details, please visit the website of the Tobacco and Alcohol Control Office at <http://www.taco.gov.hk>;
- ✓ Be aware of air pollution. Monitor public announcements of ambient air quality. Stay indoors when outdoor air quality is poor;
- ✓ Observe occupational safety and health rules to minimise occupational exposures and protect the lungs from hazard at work;
- ✓ Exercise regularly to keep the lungs healthy and maintain overall fitness;
- ✓ Get appropriate vaccinations against influenza and pneumococcal disease as recommended by the doctor.

For more information about the Government key initiatives and specific actions to reduce premature mortality from COPD and other CRDs, please refer to the SAP which can be found at the Change for Health Website of DH <https://www.change4health.gov.hk/en/saptowards2025/>.



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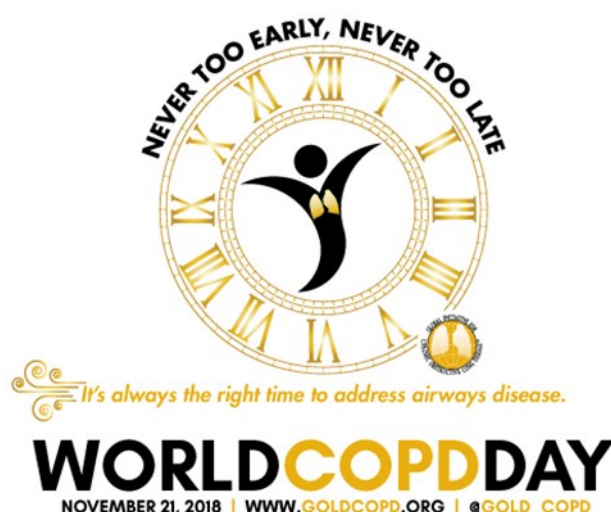
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World COPD Day

21 November 2018

World COPD Day is an annual event. Organised by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) in collaboration with health care professionals and COPD patient groups throughout the world, it aims to raise public awareness about COPD and improve COPD care.

The first World COPD Day was held in 2002. Each year GOLD chooses a theme and organisers in more than 50 countries worldwide carrying out various activities, making the day one of the world's most important COPD awareness and education events. For 2018, the World COPD Day will take place on 21 November around the theme "Never Too Early, Never Too Late".



To learn more about the World COPD Day and related information, please visit <http://goldcopd.org/world-copd-day/>.

Non-Communicable Diseases (NCD) WATCH is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to so_dp3@dh.gov.hk.

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