



## **Psychosocial Support Series** Cancer & Physical Activity

# **FIGHT. THRIVE. SURVIVE.**



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## Message from



**Yang Berhormat Dr Lee Boon Chye**

Deputy Minister of Health, Malaysia.

*Staying active is a crucial part of cancer survivorship. However, too many survivors, including those in developed countries, lead a sedentary lifestyle and do not meet the physical activity targets, risking poor health. As more people survive cancer due to advances in medicine, being physically active will empower them further.*

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# Before you read...

This booklet is intended to serve as a guide for patients. Information in this booklet does not substitute medical advice. Before embarking on any exercise regimen or programme, we advise you to consult with your healthcare professionals to determine your capacity and limitations, and adjust your programme accordingly.

# Being active in your journey of survivorship

A common misconception of cancer survivors and patients is they need to save up their energy and rest as much as possible, and avoid being too active.

The opposite is true: being physically active from the moment of diagnosis is safe, and is essential to your recovery and survivorship. Studies show being active, including exercising, helps survivors:

- avoid recurrence<sup>1,2</sup>,
- lowers their risk of death<sup>3,4</sup>, and
- reduces their chances of getting other diseases.

This includes high blood pressure, type-2 diabetes, or cardiovascular diseases and osteoporosis that can be caused by the cancer treatment.

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1. Schmitz KH, Neuhouster ML, Agurs-Collins T, et al. Impact of obesity on cancer survivorship and the potential relevance of race and ethnicity. *Journal of the National Cancer Institute* 2013; 105(18):1344-1354.

2. Ibrahim EM, Al-Homaidh A. Physical activity and survival after breast cancer diagnosis: meta-analysis of published studies. *Medical oncology*. 2011 Sep 1;28(3):753-65.

3. Irwin ML, Smith AW, McTiernan A, Ballard-Barbash R, Cronin K, Gilliland FD, Baumgartner RN, Baumgartner KB, Bernstein L. Influence of pre-and postdiagnosis physical activity on mortality in breast cancer survivors: the health, eating, activity, and lifestyle study. *Journal of clinical oncology*. 2008 Aug 20;26(24):3958.

4. Haydon AM, Macinnis RJ, English DR, Giles GG. Effect of physical activity and body size on survival after diagnosis with colorectal cancer. *Gut*. 2006; 55: 62-67.

## What is physical activity?

Physical activity is any body movement produced by muscles that uses energy<sup>7</sup>. It ranges in type (aerobic, stretching, bone strengthening) and in intensity: light, moderate, and vigorous.

Examples of physical activity include: walking, doing housework, yoga, and gardening<sup>8</sup>.



## What is exercise?

Exercise is **one type of physical activity** that is planned, structured, repetitive, and intended to improve or maintain physical fitness.

Examples include weight lifting, aerobics, jogging, swimming, squats/rows<sup>8</sup>.



### Use it or lose it

Your muscles weaken after being inactive for only two weeks.  
**In contrast**, it only takes two weeks to build up or improve your physical fitness.

5. Kang DW, Lee EY, An KY, Min J, Jeon JY, Courneya KS. Associations between physical activity and comorbidities in Korean cancer survivors. *Journal of Cancer Survivorship*. 2018 Aug 1;12(4):441-9.

6. Handforth C, D'Oronzo S, Coleman R, Brown J. Cancer treatment and bone health. *Calcified tissue international*. 2018 Feb 1;102(2):251-64.

7. World Health Organization. *Global Strategy on diet, physical activity and health*. 2011.

8. National Institute of Health (US). *Physical activity and your heart*. (n.d.) Accessed at: [www.nhlbi.nih.gov/health-topics/physical-activity-and-your-heart](http://www.nhlbi.nih.gov/health-topics/physical-activity-and-your-heart).

# When is the best time to be active?

**The answer is: always. Start immediately after diagnosis.**

Research shows exercise is beneficial for all types of cancer, whether they are carried out before, during, or after treatment<sup>9</sup>.

## After diagnosis and before cancer treatment (surgery, chemotherapy, radiotherapy)

Aerobic and resistance exercises can<sup>10,11</sup>:

- decrease post-operative complications
- increase tolerance to chemotherapy
- reduce time stayed in hospital

## During treatment<sup>9</sup>

- Compared with after treatment, this is the best time to reduce cancer-related fatigue through exercising
- Reduce depression, anxiety, insomnia
- Reverse incontinence

## After treatment<sup>9</sup>

- Decrease Immune Growth Factor (IGF) I and II, both of which are linked to an increased risk of breast cancer
- Improved immunity
- Better quality of life

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9. Stout et al., A systematic review of exercise systematic reviews in the cancer literature (2005 to 2017). Contemporary issues in cancer rehabilitation 2017. 9: 347-384

10. Moran J et al., Surgery. The ability of prehabilitation to influence postoperative outcome after intra-abdominal operation: A systematic review and meta-analysis.

11. Fairman CM., J Community Support Oncol. Effects of exercise interventions during different treatments in breast cancer. 2016;14:200-9.

# How active should cancer survivors be?

Always check with healthcare professionals on whether you are cleared to be physically active or exercise.

**Start slow and steady**

Choose an activity or exercised that fits your current fitness level.



## The Goal

International guidelines by cancer experts and physiotherapists recommend a combination of aerobic exercises and resistance exercises per week. This includes:

Type of physical activity	Target per week	Target per day
Moderate intensity exercise	2.5 hours	35 mins
OR		
Vigorous intensity aerobic exercise	1.25 hours	10 mins
AND		
Resistance exercise	2-3 sessions	



# How do you measure intensity?

The intensity of an activity or exercise is different for every person: think of it as ‘how hard is my body working?’ The best way to monitor intensity is the ‘talk test’. The more intense the activity is, the less you will be able to talk.

## What is moderate intensity exercise?

### Moderate intensity exercise



Moderate effort required. Your breath is harder, you start to sweat, and you will talk more slowly than you do normally. Examples:

- Brisk walk
- Dancing
- Cycling at a slow pace

Simple house chores or taking the stairs may also be considered moderate exercise.

## What is vigorous intensity aerobic exercise?

### Vigorous exercise



High effort required. You are puffing, sweating, and can only talk with pauses. Examples:

- Aerobics/cardio classes
- Jogging
- Cycling at a quick pace

Simple house chores or taking the stairs may also be considered moderate exercise.

# What is strength training or resistance exercise?

## Strength training



Strength training or resistance exercises involve using weights or resistance to strengthen your muscles and bones.

In general, they should involve<sup>12</sup>:



1. 5-10 exercises that target the major muscles of your arms, legs, and torso
2. 5-20 repetitions of the exercises  
One \*repetition includes:  
the start, movement, back to  
the start of the activity.

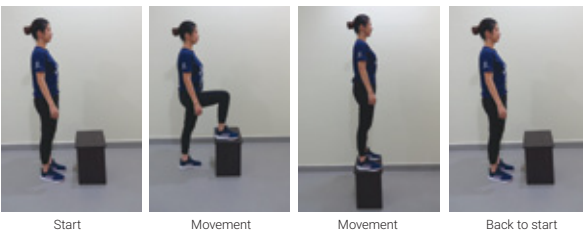
For weight-lifting, choose weights according to your capability.

3. 1-4 sets of 5 – 20 repetitions

4. A one minute or 90 second break of rest between each set



\* This is one repetition



# Before you start

**Consult medical and health professionals** on the type of physical activity or exercise, as well as the intensity, that is safe for you.

For resistance exercises, you can also check with your physiotherapist on whether you are doing them correctly.



**Each exercise session should start with a warm-up, and finish with a cool-down.** Warm up: light stretching, and 10 minutes of low intensity exercise. Cool down: light stretching and 10 minutes of relaxed activity.



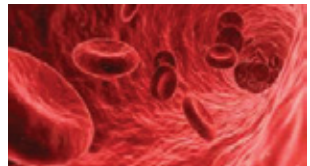
People who are **undergoing chemotherapy** or treatments that compromise their immunity should **avoid swimming or exercising in public gyms.**



**People with bone cancer**, or who are at risk of osteoporosis (thinning of the bone), should **avoid high impact activities such as jumping, jumping jacks, running, leaping.**



**People with anaemia** should **check with medical professionals** on whether it is safe for you to exercise. If possible, start with low-intensity exercises first, such as walking.



**People with Chemotherapy Induced Peripheral Neuropathy (CIPN)** may experience numbness in hands and feet, muscle weakness, and have problems with balance. If you have CIPN, **stick to low-impact exercises** that are stationary such as biking, stretches, and balancing exercises.



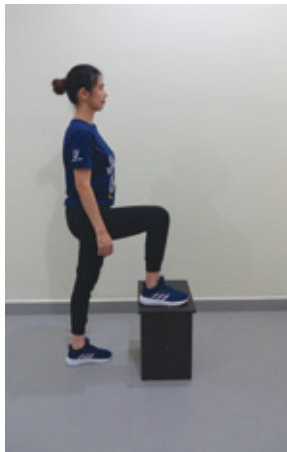
# Specific exercises for specific cancer conditions

The following exercises are recommended for patients to relieve specific conditions they face during treatment. However, other patients are free to also carry out these exercises as they see fit.

## For patients with chemotherapy induced peripheral neuropathy (CIPN)

CIPN affects up to 70% of patients undergoing chemotherapy<sup>12</sup>. The symptoms of CIPN include numbness, muscle weakness, as well as problems with balancing and coordination.

### Exercise 1: Step up



- 1 Stand below the bench in a resting position.
- 2 Step on to the bench one leg at a time, starting with your right leg.
- 3 Step down the bench, starting with your right leg.
- 4 Repeat steps 1 to 3 with your left leg.
- C Repeat the set for 1 to 2 minutes.

12. Brayall P, Donlon E, Doyle L, Leiby R, Violette K. Physical Therapy–Based Interventions Improve Balance, Function, Symptoms, and Quality of Life in Patients With Chemotherapy-Induced Peripheral Neuropathy: A Systematic Review. *Rehabilitation Oncology*. 2018 Jul 1;36(3):161-6.

## Exercise 2: Stork Stand



- 1 Stand with your arms beside your body.
- 2 Lift your right leg as high as your waist until your knee is at 90°.
- 3 Remain in this position for as long as you can.
- 4 Repeat steps 1 to 3 with your left leg.
- C Repeat the set for 5 times.

## Exercise 3: Squats



- 1 Stand in a resting position with your arms extended to the front.
- 2 Push your hips backwards and bend your knees.
- ★ Make sure your knees do not go over your toes.
- 3 Revert back to the resting position.
- C Repeat the set for 5 to 10 times.

Do this exercise every day until your condition improves.

# For patients with breast cancer

## Exercises to avoid

For two weeks post-surgery (or before your drains are removed)	Avoid shoulder flexion and abduction for more than 90 degrees
For 6 weeks post-surgery	Do not lift weights that are more than 2 kilograms
	Avoid jumping or jogging

The following exercises will help to combat post-surgical complications, including **lymphoedema** and chest tightness.

## Exercise 1: Arm lift



- 1 Lie down flat on your back.
- 2 Hold both hands together with elbows extending straight.
- 3 Swing your hands over your head.
- 4 Remain in this position for 15 seconds.
- C Repeat the set for 10 times.

## Exercise 2: Elbow winging

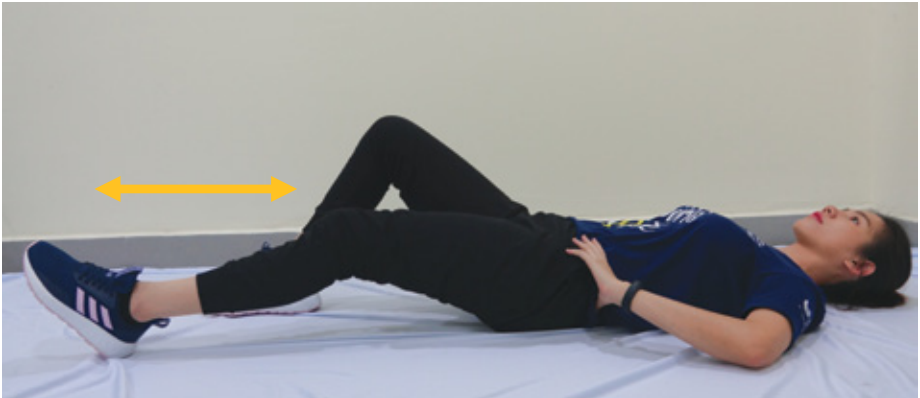


- 1 Lie down flat on your back.
- 2 Hold your hands together behind your neck, with elbows pointing up at the ceiling.
- 3 Spread your elbows apart toward the floor (like the photo)
- 4 Remain in this position for 15 seconds.
- ⌂ Repeat the set for 10 times.

## For patients with colorectal cancer

These exercises will help with strengthening your hip and abdomen after surgery. Try these exercises six weeks after surgery, but check with your health-care professionals on whether they are safe for you.

### Exercise 1: Heel Slide



- 1 Lie down flat on your back.
- 2 Slowly slide your right heel towards your buttocks, and bend your knee towards your hips.
- 3 Hold this position for 5 seconds.
- 4 Slide your right heel back down until your leg is straight.
- 5 Repeat steps 1 to 4 with your left leg.
- ★ Make sure your heels stay on the floor while you slide.
- ⌚ Repeat the set for 10 times.



## Exercise 2: Bridging



- 1 Lie down flat on your back, with your knees bent.
- 2 Push your hips upwards.
- 3 Slowly put down your hips onto the floor.
- ★ Make sure to press your feet on the floor.
- C Repeat the set for 5 to 10 times.

## For patients with gynaecological cancers

These exercises will help with strengthening your hip and abdomen after surgery. Try these exercises six weeks after surgery, but check with your health-care professionals on whether they are safe for you.

### Exercise 1: Contracting your transverse abdominal muscles



- 1 Lie down flat on your back, with your knees bent.
  - 2 Breathe in and slowly breathe out, draw in your lower abdomen.
  - 3 Hold in your lower abdomen for 10 seconds.
- ★ Make sure to breathe slowly throughout the exercise.
- Ⓢ Repeat the set for 10 times.

## Exercise 2: Contracting your transverse abdominal muscles



- 1 Sit straight on the exercise ball or chair.
- 2 Straighten your arms and touch the ball with your palms.
- 3 Draw your lower abdominal muscles inward.
- 4 Hold your lower abdominal muscles and remain in this position for 10 seconds.
- C Repeat the set for 10 times.

**Exercise 3: Heel slides** (refer to page 13 for instructions)

**Exercise 4: Bridging** (refer to page 14 for instructions)

**Exercise 5: Pelvic floor strengthening** (refer to page 17 for instructions)

## For patients with prostate cancer

This exercise will help to strengthen your pelvic floor muscles, which can be weakened after surgery, leading to incontinence. Having strong pelvic floor muscles will also stabilise your abdomen and spine.

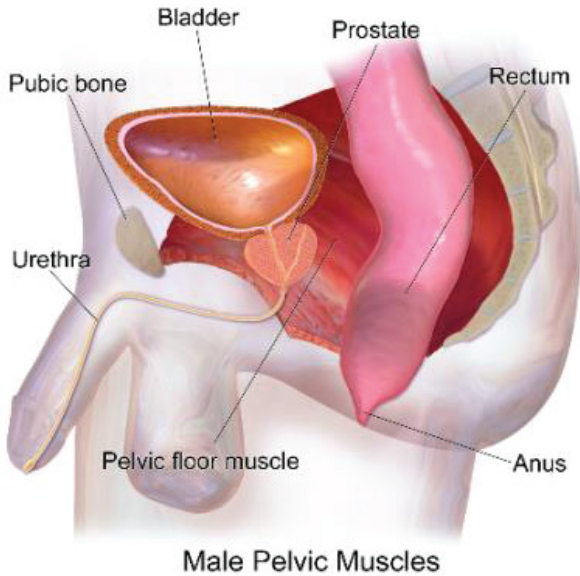


Image: BruceBlaus\*

- 1 Relax your pelvic floor and abdominal muscles.
- 2 Gently lift your pelvic floor muscles up and hold them.
- 3 Hold the contraction for up to 10 seconds.
- ☆ Make sure to breathe slowly throughout the exercise.
- ⌚ Repeat the set for 10 times, with a rest of 10-20 seconds between contractions.

## For patients with lung cancer

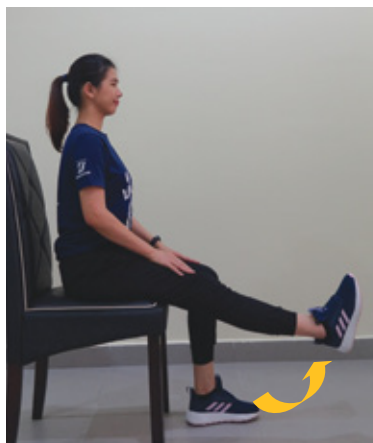
Patients with lung cancer often have difficulty breathing and moving around. These exercises can help to reduce the described difficulties by building muscle strength and endurance.

### Exercise 1: Leg lifts



- 1 Sit up straight with your feet slightly apart.
- 2 Breathe out as you lift one leg straight up so that the knee rises toward your shoulder.
- 3 Breathe in as you return your foot to the floor.
- C Repeat the set for 10 times.

### Exercise 2: Seated kicks



- 1 Sit in a relaxed position with both feet flat on the floor.
- 2 Kick your foot off the floor as you breathe out.
- 3 Breathe in.
- 4 Lower your foot back to the floor while you breathe out.
- C Repeat the set for 3 – 5 times.

### Exercise 3: Overhead arm lifts



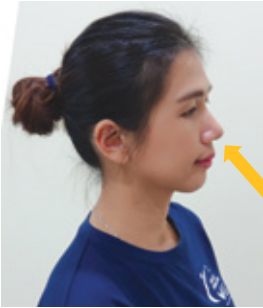
- 1 Sit up straight on a firm surface.
- 2 Lift both arms toward the ceiling as you inhale.
- 3 Lift as high as you comfortably can.
- 4 Exhale as you return your hands to your lap.
- C Repeat the set for 10 times.

### Exercise 4: Windmills

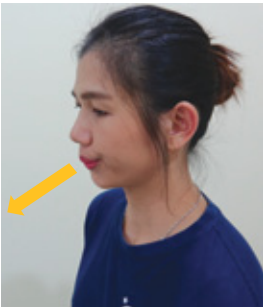


- 1 Sit with arms relaxed by your side.
- 2 Bring your arms up over your head and try to touch your palms together.
- 3 Breathe in.
- 4 Bring your arms back to the start position while you breathe out.
- C Repeat the set for 3 – 5 times.

## Exercise 5: Pursed Lip Breathing



- 1 Relax your shoulders and neck.
- 2 Gently take in a deep breath through your nostrils.



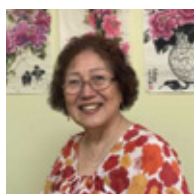
- 3 Like blowing out a candle, purse your lips.
- 4 Slowly exhale (breathe out) through your mouth.

# Testimonials



**Suzanna, cancer patient**  
**Breast cancer, stage 4**

"Before I was diagnosed with cancer I worked a lot, so I didn't find the time to be physically active in terms of exercising. But afterwards I quit my job and started eating healthier, being physically active for at least 30 minutes each and everyday and also began stretching out. Being physically active has really made me feel stronger, more energetic and gives me zest for life."



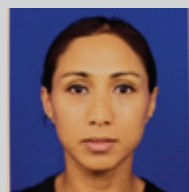
**Bella, cancer survivor**  
**Breast cancer, 2015**

"I was more active before I was diagnosed with cancer. I used to play badminton, walk a lot and do other activities. But after all the operations relating to my cancer diagnosis, my energy level is not what it used to be, and therefore it is not easy to find the strength to exercise. However, I really try to do my best especially now that I know how being physically active improves my health and mood. I do morning walks and when I'm physically active I experience better sleep, improved health and mindset and I feel as though I sweat the toxins in my body out. The days that I am physically active I feel healthier, better and happier."



**Chui See, cancer survivor**  
**Breast cancer, 2017**

"Before I was diagnosed with cancer, I wasn't that physically active. I used to do some housework and sometimes walk to certain places if I was to run some errands. After I was diagnosed I found the motivation to be more physically active, but not in an extreme sense, because of the low energy level. I go for morning walks for at least 30-45 minutes, I stretch out and I visit the National Cancer Society in Malaysia to attend the Laughter Yoga and other exercise classes. All of which improves my mood, makes me satisfied and makes me feel stronger."



**Dr Nur Fadhlna bt Abdul Satar**  
**Consultant Clinical Oncologist, University Malaya Medical Centre**

"Remaining physically active increases your fitness and wellbeing. It also combats obesity, which is linked to many non-communicable diseases such as diabetes, heart disease, and cancers. Importantly, keeping fit means your body remains strong to withstand further therapy if needed."



## Further resources

For exercises:



– Videos

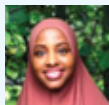
1. Strengthening exercises from Memorial Sloan Kettering Cancer Center. <https://www.youtube.com/watch?v=PTXMFMzIOsA>
2. LiveWell after breast cancer: cardio workout by Johns Hopkins Medicine : [https://www.youtube.com/watch?v=M4pY\\_qhSy2o](https://www.youtube.com/watch?v=M4pY_qhSy2o)
3. A comprehensive series of exercises for people living with cancer by Cancer Council Australia: <https://vimeo.com/showcase/4240587>
4. Abdominal and back exercises for cancer patients by the MD Anderson Cancer Center: <https://www.youtube.com/watch?v=LjDeex6uvLI>



– Website

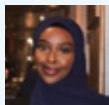
1. Cancer Council Australia has a detailed guide on exercising for people living with cancer: <https://www.cancercouncil.com.au/cancer-information/exercise-cancer/getting-started/>
2. A concise evidence review of physical activity and cancer by Macmillan Cancer Support, UK.  
[https://www.macmillan.org.uk/\\_images/the-importance-physical-activity-for-people-living-with-and-beyond-cancer\\_tcm9-290123.pdf](https://www.macmillan.org.uk/_images/the-importance-physical-activity-for-people-living-with-and-beyond-cancer_tcm9-290123.pdf)

# Authors



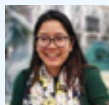
**Gali Ibrahim, Student, BSc Public Health Science, University of Southern Denmark**

Gali is a student of Public Health Science, and a course participant at Harvard University's Epidemiology Online Programme. An intern at the National Cancer Society of Malaysia, Gali aspires to contribute and devote time, energy and resources to key issues regarding public health.



**Hamda Waberi, Student, BSc Public Health Science, University of Southern Denmark**

Hamda is a curious student who went all the way to explore public health affairs in Malaysia. She endeavors to promote and improve public health issues among individuals, families, communities, countries and nations and hopes to truly make a difference one day.



**Hazel Hadian, BSc MPH DIC, Student, MBCHB, University of Sheffield**

A medical student, Hazel was at the National Cancer Society of Malaysia as part of her medical training. She is passionate about public health inequalities and access to care.



**Arif Jalal, Student, MBBS Bsc, University College London**

A second year student of medicine, Arif chose to intern at NCSM due to the importance of their work in fighting cancer by empowering the public to take control of their own health. He aspires to apply the knowledge when he becomes a medical doctor.



**Roukhaya Hassambay, Student, MSc in Public Policy - Global Health stream, Sciences Po Paris**

A curious public policy student, Roukhaya focuses on global health. She is passionate about how governance mechanisms can shape our world for the better or the worse. Roukhaya hopes to make an impact through health promotion, prevention and policy.



**Sia Wie Lin, BSc (Hons), Physiotherapy science, Northumbria University UK**

A physiotherapist, Wie Lin ensures patient wellness through promotive, preventive, curative, rehabilitative, and supportive care. She is proactive in mastering different techniques, passionate in building environments of positivity, and committed to reducing the burden of disabilities as well as chronic diseases.



**Mandy Thoo, BBiotech MSc, The Australian National University**

Head of the Health Education, Literacy, Promotion, and Policy (HELPP) department at the National Cancer Society of Malaysia (NCSM). Prior to working at NCSM, Mandy was a science writer for various Australian research institutions, and a science columnist for The Star, Malaysia's leading English daily. She also leads the Society's advocacy and policy work in non-communicable diseases.



**Dr Murallitharan M, MD MCommHSc MSc PhD**

Medical Director of National Cancer Society Malaysia. He is a Public Health physician and was a 2015/2016 Chevening Scholar at the London School of Economics and the London School of Hygiene and Tropical Medicine as well as a PhD ASEAN Economic Community Scholar at Chulalongkorn University. His research and capacity building efforts are centred around public health-related issues in non-communicable diseases especially cancer.



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