



# **COUNTRY REPORT OF VIETNAM**

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# Outline

1. Plan of atomic energy development
2. Status of cancer in Viet Nam
3. Status of radiotherapy facilities
4. Status of radiation therapy
5. Difficulties
6. Solutions
7. Conclusion

## 1. Plan of atomic energy development

In 2021, the Prime Minister approved of the task of planning the development and application of atomic energy in the 2021-2030 period, with a vision to 2050

Nuclear science and technology, human resources, nuclear safety and security

Radiation and radioisotopes in health care

Radiation and radioisotopes in agriculture

Radiation and radioisotopes in environment

Radiation and radioisotopes in industry

## 2. Status of cancer in Viet Nam

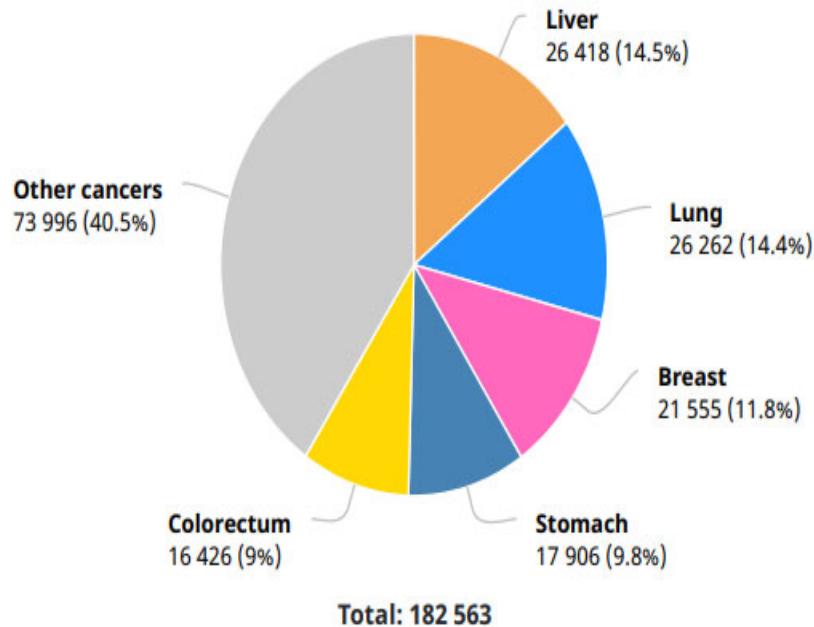
International Agency for Research on Cancer



### Viet Nam

Source: Globocan 2020

Number of new cases in 2020, both sexes, all ages



- New cancer cases:  
182.563(rank 90/185)
- Cancer death cases:  
122.690 (rank 50/185, top 2 of the world)

## 3. Status of radiotherapy facilities

- Oncology hospitals in Viet Nam:

| No. | Oncology hospital          | No. of beds |
|-----|----------------------------|-------------|
| 1   | National Cancer Hospital   | 2000        |
| 2   | Hanoi Oncology Hospital    | 300         |
| 3   | Nghe An Oncology Hospital  | 430         |
| 4   | Da Nang Oncology Hospital  | 500         |
| 5   | HCM City Oncology Hospital | 2400        |
| 6   | Can Tho Oncology Hospital  | 200         |

- 42 nuclear medicine centers
- 44 radiotherapy centers
- Production of medical radiopharmaceuticals: 1,000 Ci/year on research reactors and 350 Ci/year on 5 accelerator systems.

## 3. Status of radiotherapy facilities

- Radiation therapy equipment

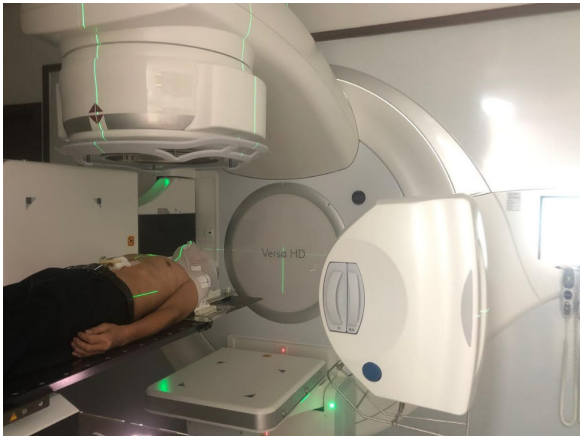
| No. | Equipment               | Quantity |
|-----|-------------------------|----------|
| 1   | LINAC                   | 77       |
| 2   | COBALT 60 UNIT          | 02       |
| 3   | GAMMAKNIFE & CYBERKNIFE | 06       |
| 4   | INTRABEAM               | 01       |
| 5   | HDR                     | 12       |
| 6   | PET-CT                  | 08       |
|     | SPECT and SPECT/CT      | 15       |
| 7   | CT SIM                  | 37       |
| 8   | CYCLOTRON               | 5        |

# 4. Status of radiation therapy

- **RT Indications**
  - Treatment all most cancers followed NCCN Guideline; Hospital Protocols (Head & Neck cancers, Breast & Gynecological cancers, Colorectal cancer, Lung cancer, Esophagus cancer, Prostate cancer...
- **Methods**
  - Radical Radiation Therapy
  - Concurrent Radiochemotherapy
  - Adjuvant Radiation Therapy (pre or post Operation)
  - Palliative Care

# 4. Status of radiation therapy

EBRT Techniques: 3D-CRT, IMRT-VMAT, SBRT, SRT



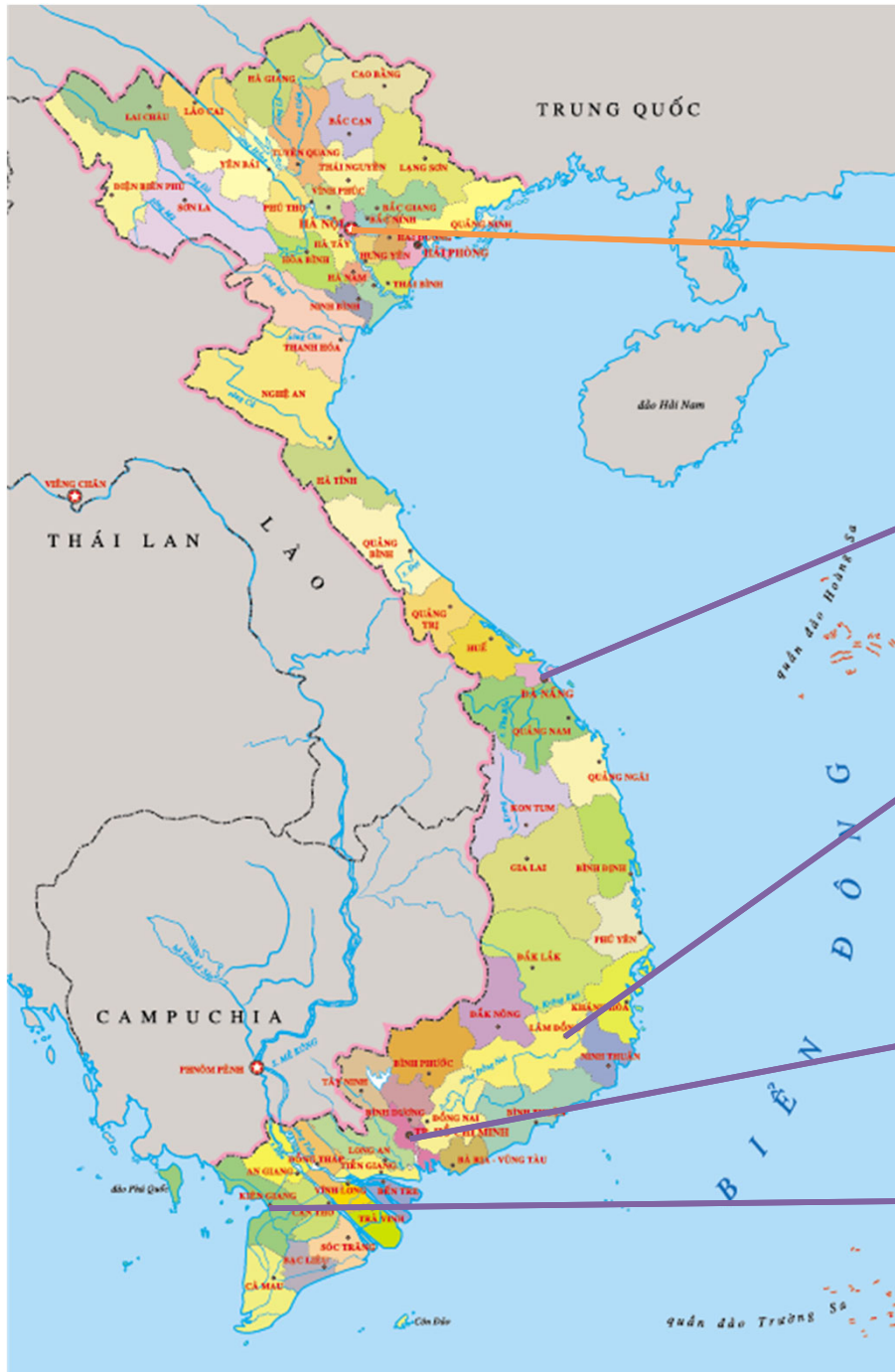


# 4. Status of radiation therapy

- Gamma Knife Icon
- HDR units Ir 192, 2D/3D CT/MRI-based
- CT SIM;
- PET/CT-SIM



# Production of radiopharmaceuticals



## Ha Noi

- Cyclotron 30MeV (108 Hospital)
- Cyclotron 9MeV (Institute of Nuclear Science and Technology)
- Cyclotron 13MeV (Hanoi Irradiation Center)

## Da Nang

- Cyclotron 13MeV (Danang Hospital)

## Da Lat

- 500KW Reactor for Research (Nuclear Research Institute). In 2019, 1,030Ci was generated.

## Ho Chi Minh city

- Cyclotron 11MeV (Cho Ray Hospital)
- Cyclotron 16MeV (Vinagamma): operating from 14/2/2020

## Kien giang (Hospital)

- Cyclotron 18MeV: Preparing for operation

## 5. Difficulties

- Lack of radiation equipment, RT facilities throughout country.
- No official program for training RT professionals in VN leads to lack of quantities and qualified staffs.
- RT sector in VN has developed so fast for the last few years results in revealing many shortcomings in the management and operation.
- Cancer hospitals are almost overloaded.
- Lack of LINAC and RT facilities especially in rural areas
- Palliative care in cancer has not been given adequate attention
- Advanced RT technique (such as IMRT, VMAT, SBRT are not used common in Provincial Hospital)
- No national guidelines for radiotherapy at national level

## 6. Solutions

- Implement contents of the National Cancer Control Program
- Training for RT professionals must be priority, (a syllabus training RT programme at Universities & colleges must be done soon for Radiation Oncologist; Medical Physicist and RTTs, join in training course of RAS/ TC project...)
- Establish more comprehensive cancer centers.
- Increase number of LINAC in whole country
- Collaborate and ask for supports from international organizations ( WHO, IAEA, FNCA...), Japanese & Korean government..., especially, knowledge transfer, training course for RT, management skills, technical support ...

# 7. Conclusion

- In recent years, research and application of radiation and radioisotopes in medicine in Vietnam has progressed significantly, yielding achievements. These achievements are the result of collaboration between ministries, sectors, localities, units for research, application, training, corporations, and international support, particularly from the International Atomic Energy Agency (IAEA).
- However, the application of nuclear engineering in medicine has not yet to catch up to its potential. Therefore, It will be important to continue to promote more actively the use of radiation and radioisotopes in medicine in order to better meet people's health-care needs.





**Thank you for your attention!**

