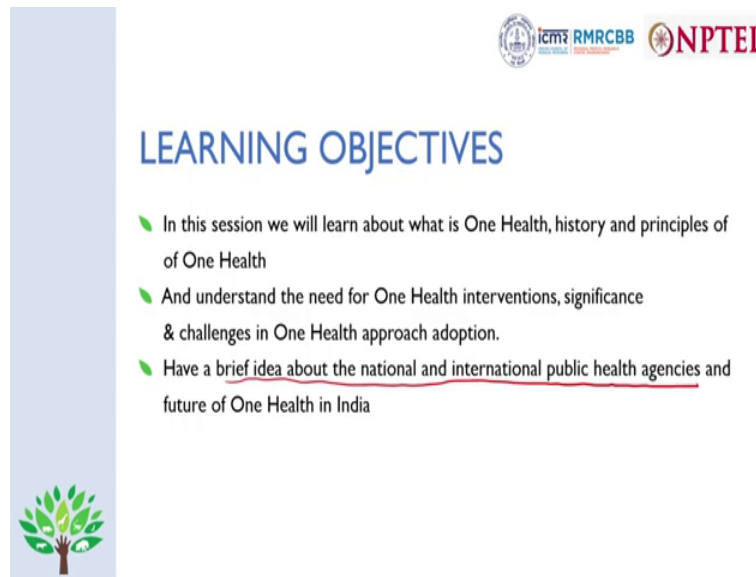





**One Health**  
**Prof. Sanghamitra Pati**  
**Indian Council of Medical Research–Regional Medical Research Centre - Bhubaneswar**

**Lecture – 01**  
**Introduction to ‘One Health’ Concept and National and International Health/Public Health Agencies**

Hello everyone, greetings from ICMR-Regional Medical Research Centre, Bhubaneswar. I am Dr. Sanghamitra Pati and today I would be speaking on Introduction to ‘One Health’ and the International and National Public Health Agencies working on ‘One Health’.

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## LEARNING OBJECTIVES

- ✔ In this session we will learn about what is One Health, history and principles of One Health
- ✔ And understand the need for One Health interventions, significance & challenges in One Health approach adoption.
- ✔ Have a brief idea about the national and international public health agencies and future of One Health in India

So, during this introduction session at the end, we will learn about what is one health? What is it is history of one health? And what are the principles of one health? And not only that we would also try to understand, why there is a need for one health intervention? And what is the significance of one health approach? And what are the challenges again in adopting one health approach towards looking at diseases of such importance.

And at the end, we would garner a brief idea about the national and international public health agencies that are working across one health in India and what is the way forward for one health in the country?

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## INTRODUCTION

### **CDC (Centers for Disease Control and Prevention) and One Health Commission (OHC) definition-**

One Health is a collaborative, multisectoral, and trans-disciplinary approach - working at local, regional, national, and global levels - to achieve optimal health (and well-being) outcomes recognizing the interconnections between people, animals, plants and their shared environment.



Now, coming to the introduction what exactly one health definition contains? And we are following the definition that has been endorsed by CDC (Centre for Disease Control and Prevention) and one health commission. So, according to these two agencies, one health has been defined as a collaborative, multi-sectoral and trans-disciplinary approach which means it cuts across the disciplines and works at local, regional, national and global levels.

So, we are having four layers local, regional, national and global levels. And what is the aim of one health approach? To achieve optimal health as well as well-being outcomes, recognizing the interconnections between people, animal, plants and their shared environment. You may say that this is everything that is under the sky is included in one health, having said that one health is understood as adopting a multi-sectoral, transdisciplinary approach.

Wherein we do not only look at human health, at the same time, we look at health of the animals, plants as well as environment.

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- ✔ One Health is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment.
- ✔ It is a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels
- ✔ The goal is to achieve optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.
- ✔ One Health obviously includes the health professions but, it also includes wildlife specialists, anthropologists, economists, environmentalists, behavioral scientists, and sociologists, among others
- ✔ Some of the global issues One Health works to address include environmental contamination, habitat use conflicts, biodiversity loss, emerging infectious diseases, antimicrobial resistance and ecosystem function degradation.



So, one health is an approach that recognizes that health of the people is closely connected to the health of the animals and our shared environment. Which means we cannot think of human health in isolation or as a stand-alone discipline, rather we have to take cognizance of the fact that population health is very closely related to health of animals as well as environment which is shared by both the living beings.

And second principle of one health is that it has to be a collaborative approach, it must include multiple sectors and it should adopt a transdisciplinary perspective that works from local to global level. And the goal, as I told I am just repeating, the goal is to achieve optimal health outcomes and recognize the interconnection between all the components of one health.

And one health obviously includes health professionals but it does not only include health professional. At the same time it also involves wildlife specialist, anthropologists, economist, environmentalist, behavioural scientist and sociologist and what not. That means one health professional did not be only population health or only veterinary health, they can come from multiple sectors and multiple disciplines.

But with a unified vision and with a unified goal that is improving optimal health outcomes and recognizing the interconnection between people, animals and shared environment. So, some of the global issues which one health strives to address include why I can give few examples which

includes environmental exposure. For example, pollution then habitats using conflict, biodiversity loss, emerging and re-emerging infectious disease.

The best example is covid-19, the recent pandemic which created catastrophe across the globe. And another very important public health challenge that a super bug or antimicrobial resistance. And of course, how do we conserve our present ecosystem while moving ahead with development?

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**History of One Health**

- ✔ A German scholar from the mid 1800's, Rudolf Virchow, was an early proponent of One Health. He said, "Between animal and human medicine there is no dividing line—nor should there be. The object is different but the experience obtained constitutes the basis of all medicine."
- ✔ In the 1980's, epidemiologist Calvin Schwabe called for a unified human and veterinary approach to combat zoonotic diseases, providing the modern foundation for One Health

Now, let us just have a very brief look at what has happened or the evolution of one health or history of one health? So, to start with a German scholar from mid-1800 that is Rudolph Virchow, he was considered to be the only proponent of one health. And in fact, his very famous quote is that "Between animal and human medicine there is no dividing line-nor should that be".

In fact, way back in 1800 Rudolf Virchow has understood or has realized the importance of one health approach and the importance of looking animal health and human health in tandem. And the object may be different what he told is that but the experience obtained from each discipline constitutes the basis of all medicine and this quote or this his observation still holds very true in the current context of one health.

And later on in 1980's the famous epidemiologist Calvin Schwabe, he called for him but he appealed that there should be unified human and veterinary approach to combat emerging and re-emerging zoonotic diseases and which is now considered to be or on taken as the modern foundation for one health. So that means even though the philosophy or the paradigm of one health had evolved way back in 1800.

But it is epidemiologist Calvin Schwabe who actually led the modern foundation for one health in 1980's. So, having said that one health seems to be a quite a recent entity only it is not even a 50 half a century old, it is only 40 plus 4 decades old.

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The slide is titled "One Health in India" and features a light blue background with a green tree icon at the bottom left. At the top right, there are logos for ICMR, RMRCBB, and NPTEL. The main content is a timeline of key events in One Health in India from 2009 to 2020, each preceded by a green leaf icon.

- 2009:** OHASA was launched by the Wildlife Trust to in India, Bangladesh, Pakistan, and Nepal to address zoonotic diseases
- 2010:** National Centre for Disease Control was established by MOHFW and GOI to strengthen health cooperation between India and USA
- 2014:** Centre for OH Education, Advocacy, Research and Training (COHEART) was launched by Kerala Veterinary and Animal Science University
- 2018:** IDSP's Integrated Health Information Platform which is new state-of-the art Information Platform was launched to monitor Public Health surveillance.
- 2019:** Department of Biotechnology (DBT), Ministry of Science and Technology in partnership with Ministry of Agriculture and Farmers' Welfare and MOHFW declared an initiative for One Health in India
- 2020:** The Maharashtra Animal and Fishery Sciences University and Indian Council of Medical Research (ICMR)-National Institute of Virology, Pune launched a centre for One Health in Maharashtra. A National Expert Group on One Health was established by the Department of Biotechnology (DBT)

Now, let us look at what has happened in one health in India and all of us know that India is one of the leading LMIC and experiencing rapid urbanization and development both economically as well as scientifically. So, just I have just noted down as you can see 2009 the beginning of was 2009 and one health action plan was launched by wildlife trust of India which also included countries like South Asia, Bangladesh, Pakistan and Nepal.

And the very aim of this OHASA was to address zoonotic diseases. In 2010, I mean just one year after the national centre NCDC which is known as National Centre for Disease Control was established by ministry of health and family welfare and government of India to strengthen health cooperation between India and USA. And 2014 so, it is very quickly the development

happened, centre for one health education, advocacy, research and training that is COHEART was launched by Kerala Veterinary in Animal Science University.

Then IDSP Integrated Health Information Platform has also launched to monitor public health surveillance. This is something I would say is a paradigm shift in surveillance where in 2018 IDSP's Integrated Health Information Platform which truly envisages one health approach for collecting data for surveillance. So, this is a landmark change and then 2019, Department of Biotechnology and Ministry of Science and Technology.

And then along with Health and Family Welfare Department declared an initiative for one health in India and this spearheaded or promulgated the research, the capacity building and projects around one health. So, it is only hardly three years from now and very I would say I would say coincidentally we had 2020 Covid-19 pandemic which reiterated the importance of adopting one health approach in the country.

And 2020 Maharashtra Animal and Fishery Science University and ICMR and as well in under the aegis of National Institute of Virology, Pune has launched a centre for one health in Nagpur. A national expert group on one health has also been set up having I mean all these events reiterate or symbolize or embody the fact that one health has been accepted as a very important public health issue by Government of India and Ministry of Health and Family Welfare.

And at the same time one health is also now in the phase of not only expanding but also taking I mean the future lies with one health that is what it signifies.

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## Need for One Health Interventions

| Factors   | Impact  |
|---|---|
| Human population is increasing and expanding into new geographic areas  | Resulting in more people <u>living in close contact with wild and domestic animals</u> which further provides more opportunities for diseases to pass between animals and people. |
| The earth has experienced changes in climate and land use, such as deforestation, intensive farming practices, etc. | Leading to disruptions in environmental conditions and habitats that provide new <u>opportunities for diseases to pass to animals</u>   |
| Rise in <u>International travel and trade</u>   | Resulting in diseases being spread quickly across the globe   |



So, now what are the needs of one health intervention? So, why do we after all need one health approach? What was not so, I mean what were the limitations of traditional human health or veterinary health in isolation approaches? So, why do we need one health intervention if we see different factors like most important factor as I told, India is one of the high expanding country in terms of population and urbanization and economic growth.

So, human population is increasing and expanding into new geographic areas. So, when we are expanding or we are urbanising or we are deforesting or we are destabilizing the already habitat, so what happens is that, there is a very close interface between humans and wildlife and domestic animals. So, very close human animal interface is going to be more and more with our expanding urbanization.

This is going to be the fact and this is what is also we are seeing other vector conditions like dengue, those places which are in the phase of urbanization are experiencing more burden of dengue compared to their counterparts. So, this provides in our conducive and environment or a very fertile ground for disease transmission in mutual direction from animals to humans as well as from humans to animals.

So, first factor that is responsible or that is instrumental highlighting the need for one health intervention is that we as a human population increasing and also expanding in terms of

urbanization. The second is climate change, all of us know that globally all of us have been experiencing climate change and this change in climate is due to our progressive deforestation different farming approaches or so many factors are into it.

So, climate change is another factor which has led to disruption in environmental condition and habitats as a result of which there is another again opportunity for diseases to pass to animals. So, second leading factor contributing to a need for one health intervention is climate change. So, first is increasing urbanization and population growth and second is climate change.

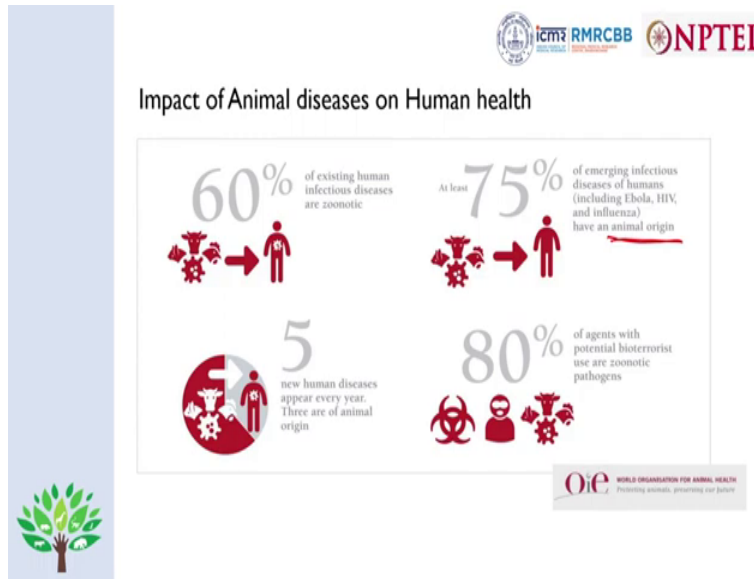
And third is all of us know increased global mobility that has been a high rise or increasing use of International travel for trade and for other reasons. So, for instance all of you might recollect, when SARS or H1N1 pandemic happened, the proportion was not so much but covid-19 affected everyone in the world. And one of the reason for that was that we as a globe were a very small the world is small that is told.

So, the global mobility and there has been so much of movement across the globe so, we cannot say that one disease which is now in one country will not be spreading to other countries. So, there is no such border nowadays so, rise in international travel and trade is another reason for which any disease zoonotic disease that occurs at one place spreads very quickly across the globe.

That means globally all of us have to recognize the importance of one health intervention and start working as a team together.

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Now, let us see what has been the impact of animal diseases on human health? So, 60 percent of current human infectious diseases are zoonotic, be it Covid, be it H1N1, be it rabies. So, 60 percent of existing human infectious diseases are zoonotic. And 75 percent at least emerging infectious diseases which include Ebola, HIV and influenza do have an animal origin. All of us know that HIV there is resource monkey all of us know.

So, HIV, Ebola though now their transmission is from human to human but to start with a hard animal origin. And five new human diseases appear every year of which three are of animal is origin so, it is quite, the situation is quite concerning. So, most of the in emerging or the new infections are going to be viral and majority of them are going to be zoonotic in nature.

And 80 percent of agents which are being used as potential for as a bioterrorist weapon are zoonotic pathogens. So, these figures are with self-explanatory to impress upon the importance of one health and the importance of or the impact of animal health on human health. So, we can no longer consider human health in isolation.

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## India as a Hotspot for many Zoonotic diseases

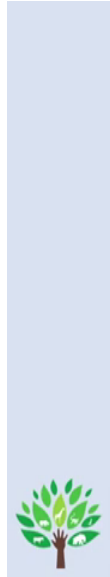
|   | Brucellosis | Tuberculosis | Leptospirosis | Cysticercosis | Q fever  | Trypanosomiasis | Food-borne bacteria |
|---|-------------|--------------|---------------|---------------|----------|-----------------|---------------------|
| 1 | Togo        | Bangladesh   | Ethiopia      | Rwanda        | Nigeria  | Sudan           | Tanzania            |
| 2 | Mali        | Burkina      | Vietnam       | Congo         | Zimbabwe | Mozambique      | South Africa        |
| 3 | Ivory Coast | Pakistan     | Nigeria       | Chad          | India    | Tanzania        | Gambia              |
| 4 | Zambia      | Ghana        | Egypt         | Togo          | Egypt    | Ethiopia        | Vietnam             |
| 5 | Niger       | Kenya        | Malaysia      | Nigeria       |          | Cameroon        | Nigeria             |
| 6 | India       | Mali         |               | Ghana         |          | Nigeria         | Senegal             |
| 7 | Sudan       | Cameroon     |               |               |          | Burkina Faso    | India               |
| 8 | Cameroon    | Chad         |               |               |          |                 | Egypt               |
| 9 | Burundi     | India        |               |               |          |                 |                     |
|   |             | Ethiopia     |               |               |          |                 |                     |



Now, let us see where India as a country stands. So, when we see India here if you see India has become a hot spot for quite a few zoonotic diseases. For example, when we look at brucellosis you can see the pink mark around India. And similarly, for TB, bovine TB not other TB but bovine TB is a zoonotic infection. So, when we see tuberculosis again India's pitches in the list and similarly Q fever and at the same time food-borne bacterial pathogens.

So, this table itself shows that India is becoming slowly a hot spot for many zoonotic diseases and with our expanding urbanization and population movement we may witness many more zoonotic diseases in the coming days.

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#### RISE IN FOOD BORNE DISEASES:

Foodborne diseases cost India about \$28 billion (Rs1,78,100 crore) or around 0.5% of the country's gross domestic product (GDP) every year

#### ANTI MICROBIAL RESISTANCE:

India showed the highest consumption of antibiotics by a report in 2015. It is said that failure to address the problem of antibiotic resistance could result in 10 million deaths by 2050.

#### BIO-TERRORISM:

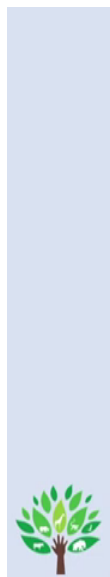
It is a global threat and an eye opener to display the extent of danger caused by misuse of viruses and bacteria. India is yet to have a law on it.

#### RE-EMERGENCE OF INFECTIOUS DISEASES:

The diseases that were a threat to the country have been re-emerging over the years. Not all diseases have been eradicated.

Now, let us see for example, one is rise in food-borne diseases has affected our GDP or gross domestic product. So, it is not only about human health it also affects the economic growth and productivity then anti-microbial resistance then bio-terrorism and reinfection of infectious diseases. So, all these are not only important but also they might be now seen in the coming days when India is concerned.

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## Principles of One Health, Manhattan

- Recognize the essential link between human, domestic animal and wildlife health and that decisions regarding land and water use have real implications for health.
- Include wildlife health science as an essential component of global disease prevention.
- Devise adaptive, holistic and forward-looking approaches to the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases
- Integrate biodiversity conservation perspectives and human needs when developing solutions to infectious disease threats.
- Reduce the demand for and better regulate the international live wildlife and bushmeat trade
- Increase investment in the global human and animal health infrastructure
- Form collaborative relationships among governments, local people, and the private and public sectors and provide adequate resources and support for global wildlife health surveillance networks
- Invest in educating and raising awareness among the world's people

Now, let us look at what are the principles of one health? So, one health must recognize I may I may sound repetitive but for the sake of repetition I would say that one health must recognize the essential link between human domestic animal and wildlife health. And not only that our

decisions of today's our decisions of using our land and water use, will have implications for health in future or for our next generations.

So, we have to be very careful about environmental use and our progressive land use for urban growth and for other purposes. And secondly, we must include wildlife health science as an essential component. If at all we are looking at global disease prevention, we cannot exclude or ignore wildlife health sciences, then device adaptive holistic and forward-looking approaches.

Which means ours whatever intervention or whatever approach or whatever strategy we are planning to adopt for prevention, surveillance, monitoring, control and mitigation of emerging and re-emerging diseases it has to be adaptive which means, it has to accommodate or it has to be acclimatized to the current situation. I mean what is the strategy of today may not be good enough after a few years.

So, every time our strategy has to be dynamic; and it has to adapt to the current context and the current epidemiological and other factors. And second given that we are working in one health approach has to be holistic, without holism. Holism is the key in fact in one health it has to improve include all the sectors. And third our approach must be futuristic, it should have a forward-looking approach rather than thinking about the traditional methods.

We should look at digital health, we should look at artificial intelligence. So, different new approaches or out of box approaches must be thought of when we are looking at one health. So, we have to include or think of including biodiversity consumption perspectives and human needs. Whenever we are looking at developing solutions for pandemics or for emerging infections, we have to think or we have to plan how we can conserve biodiversity?

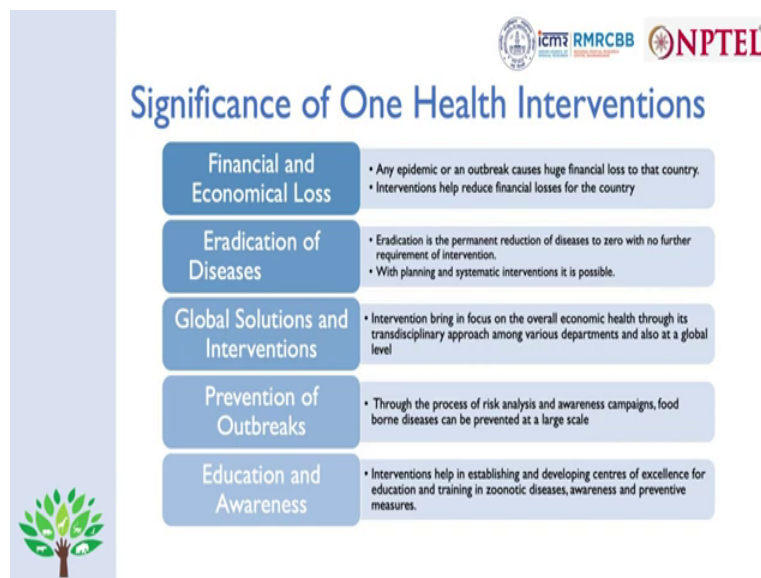
So, whenever we are promoting or whenever you are we are proposing any new activity. Any new industry or a new venture this should have a component on how this particular initiative is also not going to disrupt the existing biodiversity, that is something one health must and research or one health must impress upon. Then reduce the demand and better regulate international life wildlife that is very important.

And increase investment which is very, very I find it very important, global human and animal health infrastructure. Covid-19 has taught us how infrastructure especially laboratory and epidemiology facilities are very important for controlling or curbing a pandemic. So, we must start investing in global human and animal health infrastructure if we are looking at one health approach for controlling not only emerging, re-emerging but also current zoonotic diseases.

And form collaboration again collaboration is the key. So, we have to foster partnerships across different sectors or stakeholders which include government, local community, public private partnership, NGO's and provide adequate resources, it is very important. And last but not the least, invest in educating and creating awareness. Because for example, if we are looking at antimicrobial resistance, unless our community or our people are sensitized about the misuse of antibiotics.

How much we create strategies or plans for antimicrobial resistance, it will not hold good unless we have a very strong antimicrobial stewardship for the people, with the people and by the people.

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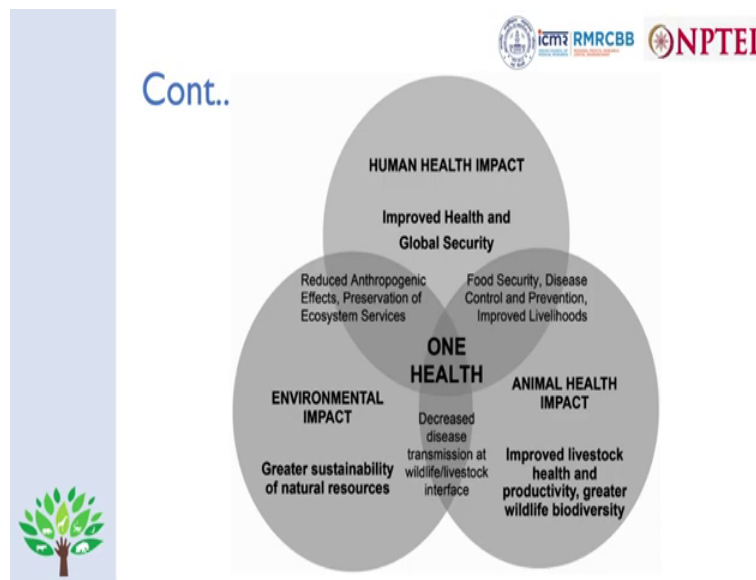


Now, let us look at the significance of one health intervention. It is not only help us in eradication of disease, it will also help reducing our financial and economic loss. Because of any

pandemic, I mean the catastrophic impact of covid-19 is well known to everyone, I mean how people lost their job, livelihoods, lives. So, financial and economic loss reduction is one of the key outcome or key significance of adopting one health intervention.

Then eradication of diseases for example, rabies so, rabies is now a low hanging **fruit (19:10)** which has to be eradicated from India then global solutions and interventions and prevention of outbreaks and education and awareness.

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So, coming to this one health approach and it is impact if you see the impact of one health approach it is human health impact which means improved health and global security, reduced anthropogenic effects and preservation of ecosystem services. I mean the list is very I would say full when we look at the impact of human health and then similarly environmental impact and animal health impact.

That means, even if we adopt one holistic approach that is one health the impact is going to be many fold across many disciplines which include human sector, environmental sector and animal health sector. So, one health approach includes all and impacts all.

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## Challenges of One Health Approach

- One Health Approach requires coordination and collaboration between Global Institutions and Agencies which can become challenging at times.
- Indian subcontinent is a 'hotspot' for zoonotic, drug-resistant and vector-borne pathogens but we know little about the key threats
- Concepts of One health, its significance and importance has yet to be addressed in the form of education and awareness.
- Coordination between medical and veterinary colleges to practice, propose and promote one health interventions is limited as well.



Now having said that one may ask I mean if one health approach is so sustainable if one health approach is so impactful and so wholesome, then why do not we approach or why do not we use one health approach every time? But one health approach has also its own challenges because it is new, it is being now in the stage of rolled out. So, what are the challenges where others have experienced in adopting one health is that.

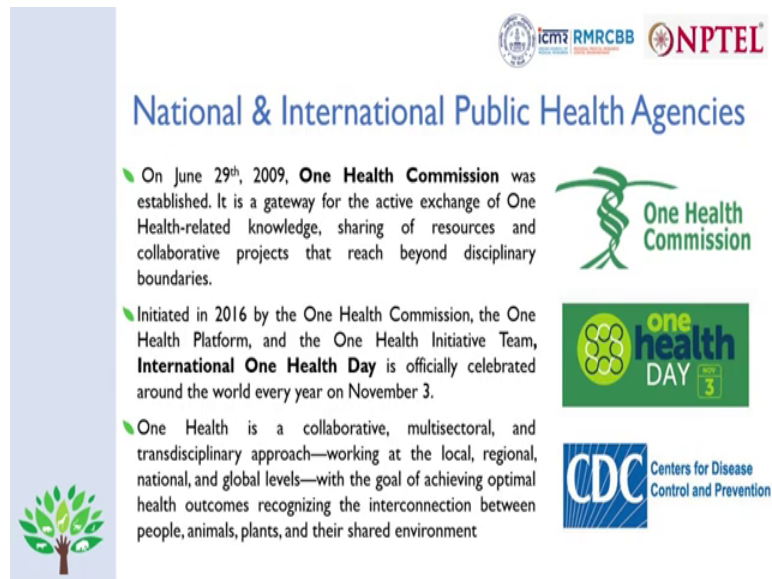
So, when we look at or when you compare animal sector versus medical human health sector. The veterinarian community has incorporated the concept of one health much faster compared to the medical counterpart. And second that means now we need to have more advocacy with public health professionals for adopting one health approach and then Indian subcontinent is a hot spot for number of one health.

I mean diseases of one health importance which include zoonotic then drug resistance like MDR, TB and vector-borne pathogens. But less knowledge, the knowledge generation regarding these key threats is yet to be commensurate with the burden we have. And we do have now India has in the process of every district is being made into a medical college. So, when we are having so many medical colleges and veterinary colleges at the same time.

The coordination between these two academic disciplines or institutions has been almost negligent or non-existent. This is one area which needs very strong, I would say leadership how

we can have linkages across between veterinary and medical colleges. Because the true philosophy of one health can be achieved if these two sectors coordinate in research and in disease outbreak control.

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**National & International Public Health Agencies**

- On June 29<sup>th</sup>, 2009, **One Health Commission** was established. It is a gateway for the active exchange of One Health-related knowledge, sharing of resources and collaborative projects that reach beyond disciplinary boundaries.
- Initiated in 2016 by the One Health Commission, the One Health Platform, and the One Health Initiative Team, **International One Health Day** is officially celebrated around the world every year on November 3.
- One Health is a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment

Now, let us look at who are the national and international public health agencies, who are the key players or key actors in one health arena? So, one is one health commission, second is the international one health day all of us to commemorate or to officially for solidarity to one health commission. So, every year November 3rd is being observed as international one health day.

Then one health is a I mean all of us known CDC is one of the major stakeholder in one health, the definition has been given by CDC. So, having said that one health commission; CDC are the globally two players. But now most of the LMIC or low and middle income countries are coming up with their own one health action plan with their one health experts, the way I have told India's history and evolution of one health in India. So, we are as a country we are also progressing ahead as a national team for one health.

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- ✓ The **World One Health Congress (WOHC)** is the world's premier Congress to advance the One Health agenda.
- ✓ The **Food and Agriculture Organization of the United Nations (FAO)**, the **World Organization for Animal Health (OIE)** and the **World Health Organization (WHO)**, under their tripartite agreement and in collaboration with the **United Nations Children's Fund (UNICEF)** and the **World Bank**, have developed many strategies for the One Health approach








Then that is every year there is world one health congress is being held and food and agriculture organization and organizations of animal health and world health organization they are globally playing major role in one health. And of course, UNICEF and World Bank have developed many strategies for the one health approach. Because as the name suggests one health cannot be done by one organization, it has to be many organizations working for one direction.

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## Future of One Health in India

- ✓ The necessity of a coordinated, collaborative, multi-disciplinary, and cross-sectorial approach to address potential health risk paved the way for "**One Health**" thinking in India
- ✓ The Government of India decided to set up a dedicated centre under ICMR to contain zoonotic diseases — **the Centre for One Health at Nagpur**, and
- ✓ **One Health Support Unit (OHSU)** initiated by the Department of Animal Husbandry and Dairying (DAHD), GOI has designed a One Health Framework for India on April 2022 with the objective to develop a National One Health roadmap based on the learnings of the pilot project implementation in Uttarakhand.

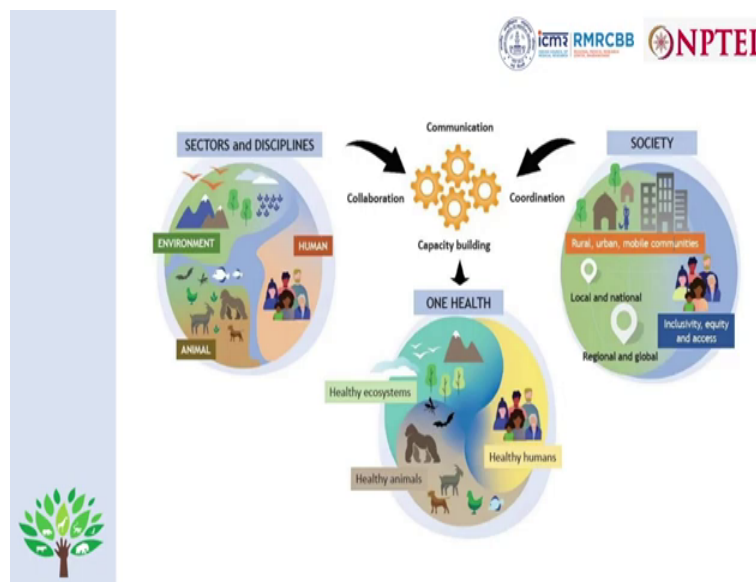
Now, let us just have a look at having said because now all of you are taking this course on one health. So, you must be curious to know what is the future of one health in India? As I told, the future of one health is of I would say the whole world is open for one health. So, when it comes

to future of one health in India the necessity for that is the need for coordinated collaborative and multidisciplinary and cross-sectoral approach.

So, one health thinking has started in India, here let me say that every almost all the states have got a zoonotic disease research committee. And every zoonotic state, zoonotic disease research committee has representative or have members from different sectors. So, already the centre for one health in Nagpur is in the process of getting construction, I mean the setting up of centre for one health and Nagpur is going on.

One health support unit has been again initiated by here the leadership has been from the department of animal husbandry dairy and government of India have designed a one health framework.

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And the figure, the diagram as it shows basically the sectors and disciplines under one health, are environment. I mean it is just in capsule what I have been saying or we have been discussing all through. So, environment animal and human sectors all are working for one health and that there is a need for collaboration, communication, coordination and capacity building, the four C's of one health and society.

Then very important player are the society and the local and national level, as well as regional and global response. And one health approach must lead to healthy ecosystem, healthy humans and healthy animals.

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## References

- ▶ [https://www.aphis.usda.gov/animal\\_health/one\\_health/downloads/one\\_health\\_info\\_sheet.pdf](https://www.aphis.usda.gov/animal_health/one_health/downloads/one_health_info_sheet.pdf)
- ▶ <https://oneworldonehealth.wcs.org/About-Us/Mission/The-Manhattan-Principles.aspx#:~:text=Recognize%20the%20essential%20link%20between,functioning%20ecosystems%20we%20all%20require>
- ▶ <https://www.downtoearth.org.in/blog/health/one-health-what-it-is-how-it-can-be-implemented-in-india-83673>
- ▶ <https://www.cdc.gov/onehealth/in-action/index.html>
- ▶ [file:///C:/Users/USER/Downloads/India\\_to\\_envision\\_One\\_Health\\_movement\\_for\\_confront.pdf](file:///C:/Users/USER/Downloads/India_to_envision_One_Health_movement_for_confront.pdf)



So, these are the few references if you are interested, you can please I would suggest and encourage you to look at these references and have a broader understanding. And if you have any questions, any doubts you may feel free to get in touch and we will be there to be of any support if we can. I hope you liked the first session and I must say here that there are a series of lectures going to follow introduction and I sincerely look forward to a mutually enriching and interesting learning journey. Thank you all for enrolling into this course. All the best.