

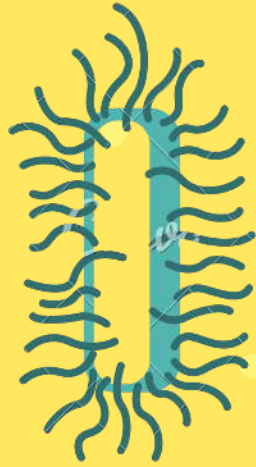


# SUPERHEROES AGAINST SUPERBUGS

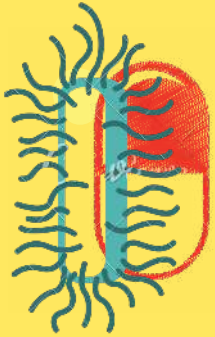


**Are you ready to be one?**

Prepared by Dr Sarah Iqbal, Wellcome Trust/DBT India Alliance

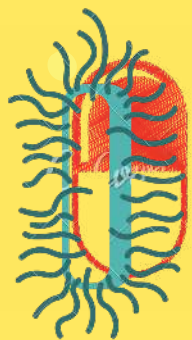


**What have we learnt  
about "bugs" and "drugs"?**



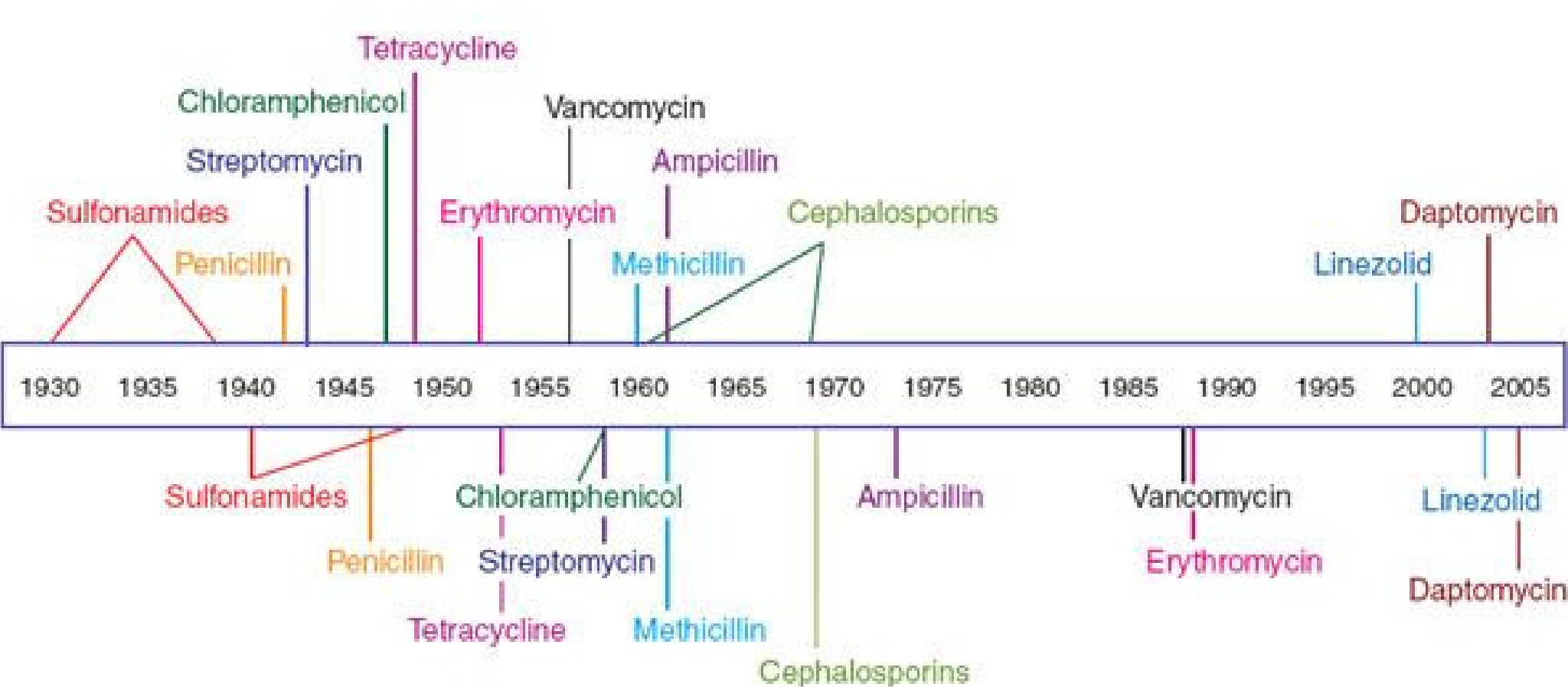
# ANTIBIOTIC RESISTANCE

- Antibiotic resistance is a natural phenomenon exhibited by bacteria - survival of the fittest
- Bacteria changes and develops resistance against antibiotics - they become Superbugs
- Superbugs multiply and make more Superbugs

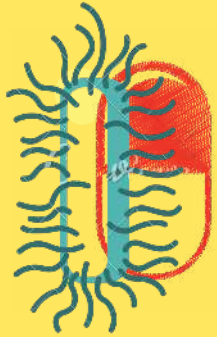


# ANTIBIOTIC RESISTANCE

Antibiotic deployment



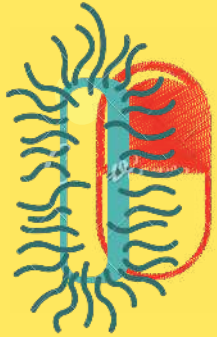
Antibiotic resistance observed



# E.G. OF ANTIBIOTIC RESISTANT BACTERIA

## **Clostridium difficile (C. difficile)**

- This bacteria usually invades after antibiotics have ruined the normal bacterial ecosystem of the gut
- symptoms like painful, bloody diarrhea and fevers.
- It's often found in hospitals and group homes, and frequently is fatal for the elderly.
- This bacteria is naturally resistant to many antibiotics and generates spores that are particularly tough to kill.

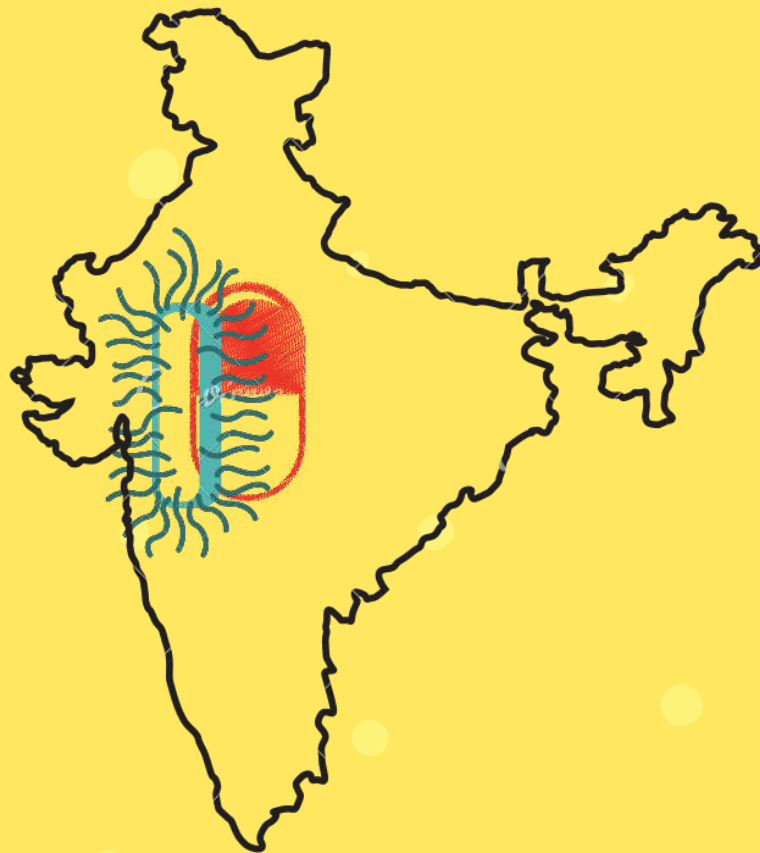


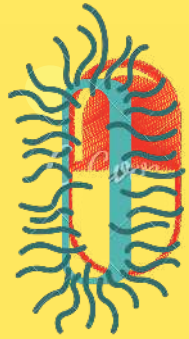
# E.G. OF ANTIBIOTIC RESISTANT BACTERIA

## New Delhi Metallo-beta-lactamase-1 (NDM-1)

- Named after New Delhi, the capital city of India, as it was first found in a Swedish national who fell ill with an antibiotic-resistant bacterial infection that he acquired in India
- Antibiotic-resistant bacteria was found in drinking water and seepage samples in New Delhi

# ANTIBIOTIC RESISTANCE IN INDIA

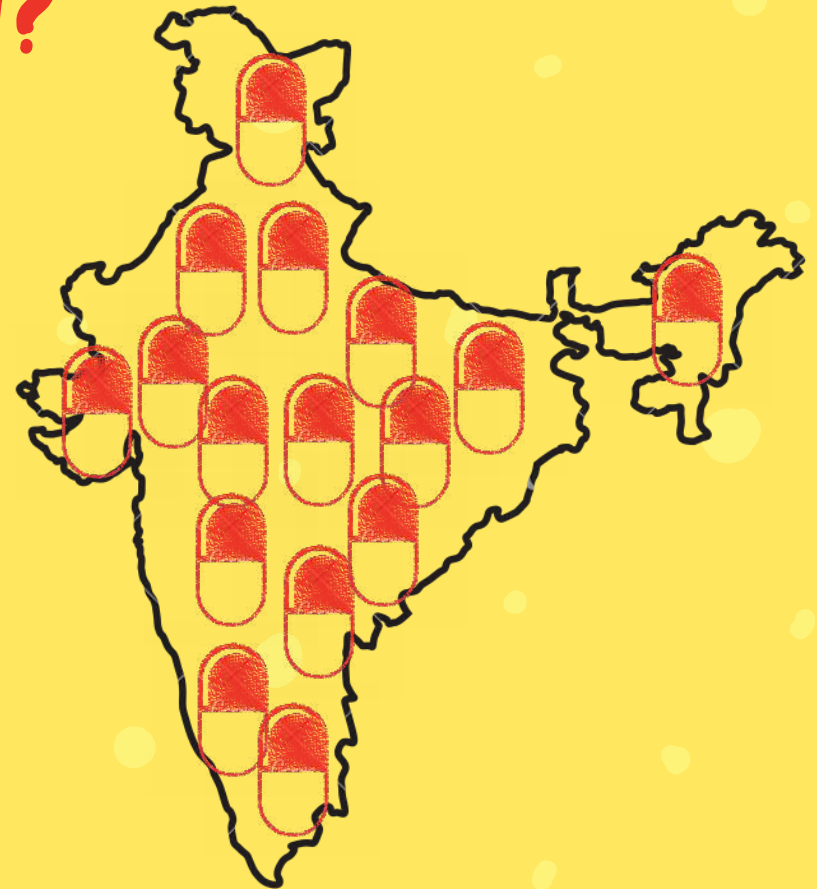




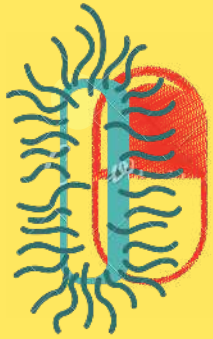
# INDIA IS THE BIGGEST PRODUCER AND CONSUMER

**Did you know?**

India is one of the  
biggest producers and  
consumers of  
**Antibiotics** in the  
world





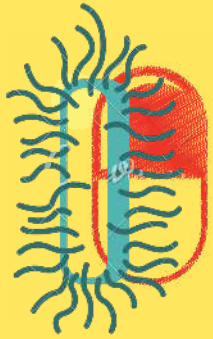


# ANTIBIOTIC RESISTANCE

Why has it become a problem?

**2. Antibiotics are sold by pharmacies without a doctor's prescription**





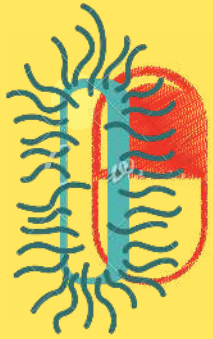
# ANTIBIOTIC RESISTANCE

Why has it become a problem?

**1. Irresponsible use of Antibiotics.**

**If you don't finish the course of your antibiotics or you take antibiotics for infections that are not caused by bacteria**





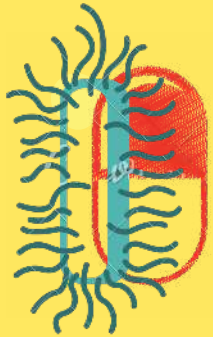
# ANTIBIOTIC RESISTANCE

Did you know?

Government of India  
has introduced a  
**red line** on  
medicines/drugs  
that should be sold  
only on doctor's  
prescription

DO YOU KNOW?  
MEDICINES WITH A **RED LINE** ON  
THE STRIP SHOULD NEVER BE CONSUMED  
WITHOUT DOCTOR'S PRESCRIPTION



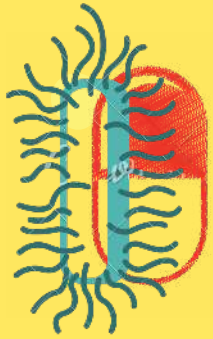


# ANTIBIOTIC MISUSE

**What can you do?**

- Only take antibiotics when prescribed by a **qualified** doctor
- Only use antibiotics for bacterial infections
- Finish the course of antibiotics
- Take flu shots(vaccines) before the flu season gets underway



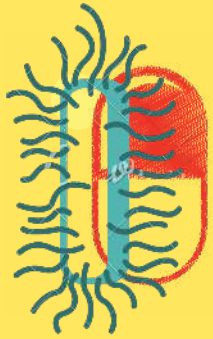


# ANTIBIOTIC RESISTANCE

Why has it become a problem?

**3. Pharmaceutical companies are dumping antibiotics in nearby water bodies**



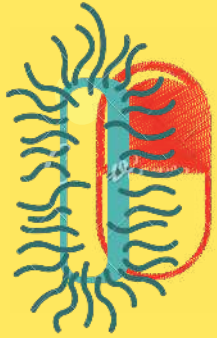


# ANTIBIOTIC RESISTANCE

Why is it a problem?

4. Antibiotics are given to farm animals such as chickens, cows, pigs, shrimps etc.





# ANTIBIOTIC RESISTANCE

Why is it a problem?

**5. Poor hygiene  
and sanitation is  
causing fast  
spread of  
infections**





# ANTIBIOTIC RESISTANCE

Why is it a problem?

6. Climate change and Global Warming are responsible for misuse of antibiotics, spread of infections and is helping superbugs multiply faster



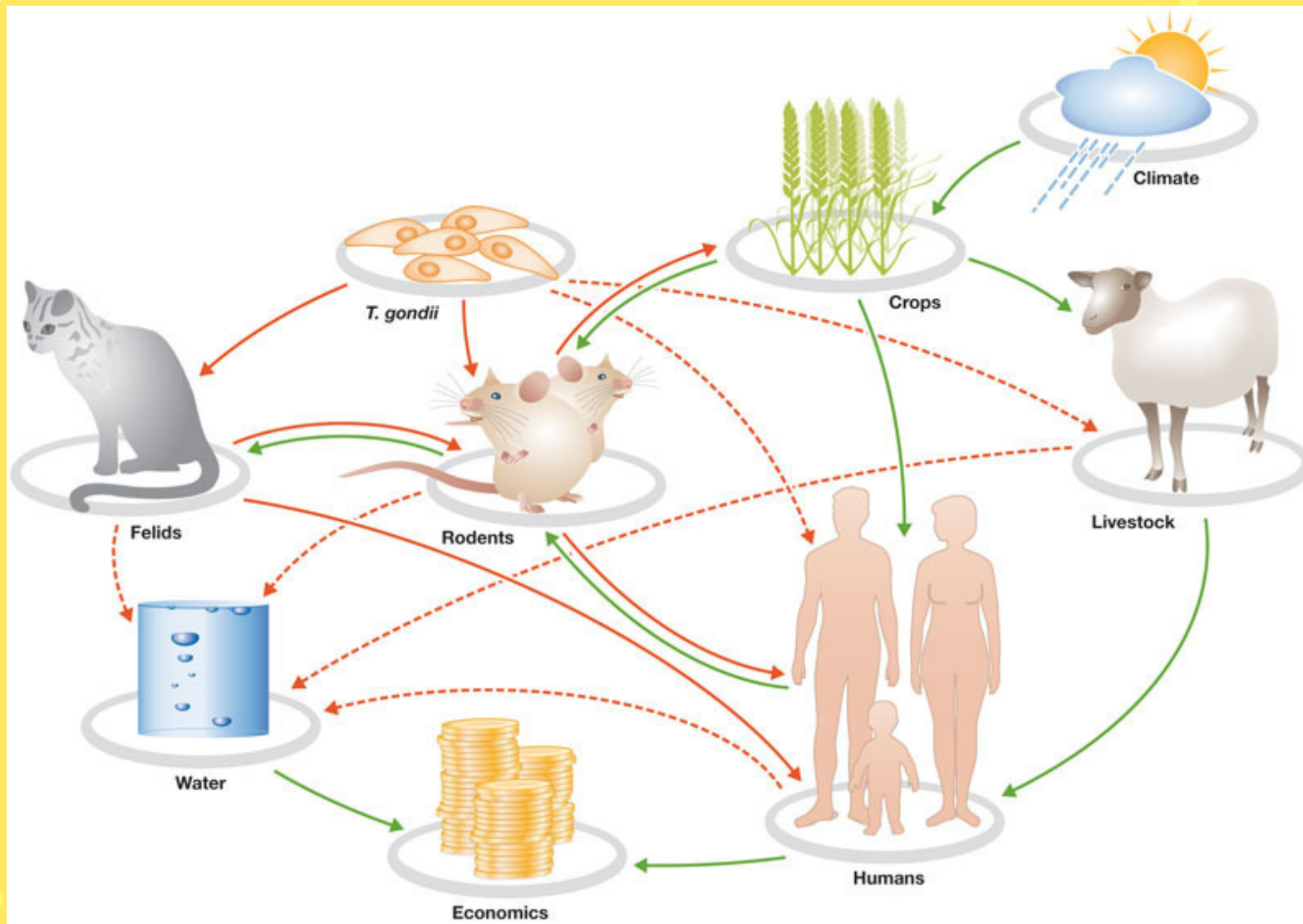


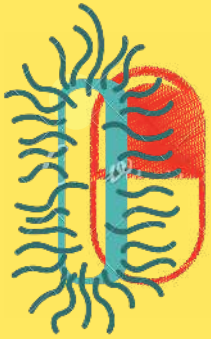


# SPREAD OF INFECTIONS



# HUMANS, ANIMALS AND ENVIRONMENT





# ENVIRONMENTAL POLLUTION

**What can you do?**

**Educate your family, friends and other members of the community to ensure antibiotics are not used only when necessarily**



# POOR SANITATION & HYGIENE

**What can you do?**

**Keep your surrounding clean - don't throw garbage on the streets- use dustbins - use toilets**

**When sneezing or coughing, cover your mouth**

**Wash your hands properly**





# ANTIBIOTIC RESISTANCE

Why is it a problem?

**6. Antibiotic Resistance is happening too fast- scientists are unable to make drugs that are able to kill Superbugs at the same speed**





# ANTIBIOTIC RESISTANCE

**What can you do?**

**Become a scientist, a doctor, a health  
worker to find treatments, to cure  
patients**



WHAT'S YOUR  
SUPERHERO AGAINST SUPERBUG  
STORY?



# ELEMENTS OF A STORY



**Theme**  
**Plot**  
**Character**  
**Setting**  
**Conflict**  
**Climax**





# PARTS OF A STORY



## THEME

Antibiotic misuse, infections,  
hygiene, sanitation, Antibiotic  
resistance



# PARTS OF A STORY



## PLOT

sequence of events and actions  
by the "characters" around the  
"drama"



# PARTS OF A STORY



# CHARACTERS

"Superheroes" - school student,  
doctor, scientist, teacher,  
cleaner...



# PARTS OF A STORY



## SETTING

Home, school, shopping mall,  
park....

Which city, month, year?



# PARTS OF A STORY



## DRAMA

Problem the "superhero(es)"  
faces - Antibiotic Resistance



## PARTS OF A STORY



# CLIMAX or RESOLUTION

How the "superhero(es)" solves  
the problem