It's a compartmental model, a very general modelling technique. Often applied to the mathematical modelling of infectious diseases, like COVID-19

SVIRS Model

N(t) = S(t) + V(t) + I(t) + R(t)

can be described by a system of ODEs

$$\frac{\mathrm{d}S}{\mathrm{d}t} = \omega_r R - \lambda S + \omega_v V - \phi S$$

$$\frac{\mathrm{d}V}{\mathrm{d}t} = -(1-\psi)\lambda V - \omega_v V + \phi S$$

$$\frac{\mathrm{d}I}{\mathrm{d}t} = \lambda S + (1-\psi)\lambda V - \gamma I$$

$$\frac{\mathrm{d}R}{\mathrm{d}t} = \gamma I - \omega_r R$$

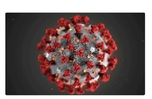
variation of SIR model

- SUSCEPTIBLE (S)
- INFECTED (I)
- RECOVERED (R)

divides the human population into four subpopulations: those **susceptible** to COVID, **vaccinated**, **infected**, and **recovered** from COVID

although those who have recovered become susceptible again at some point

COVID-19 #



transmitted when people breathe in air contaminated by droplets/aerosols and small airborne particles containing the virus

cause respiratory tract infections that can range from mild to lethal

symptoms

- Cough
- Fever
- Headache
- Fatigue
- Breathing difficulties
- Loss of smell/taste

diagnosis

- Imaging: Chest CT scans may be helpful to diagnose COVID-19 in individuals with a high clinical suspicion of infection but are not recommended for routine screening
- Viral testing: The standard methods of testing for presence of SARS-CoV-2 are nucleic acid tests, which detects the presence of viral RNA fragments

vaccine

- **Coronavac (Butantan)**
- **Comirnaty (Pfizer/Wyeth)**
- **Janssen Vaccine (Janssen-Cilag)**
- **Oxford/Covishield (Fiocruz e Astrazeneca)**
- Sputnik
- Covaxin (SUSPENSA)

prevention

- face masks
- social distancing
- hand-washing and hygiene
- avoiding crowded indoor spaces

The first known Covid-19 case was a vendor at the live-animal market in **Wuhan, China** in december, **2019**

As of 7 September 2022, more than 6.5 million deaths had been attributed to COVID-19.