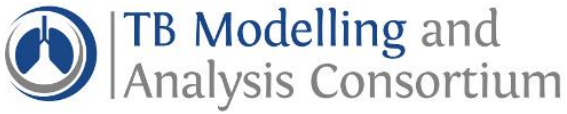
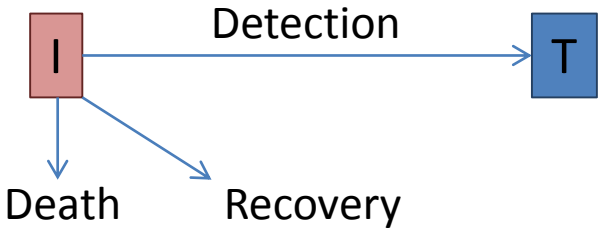
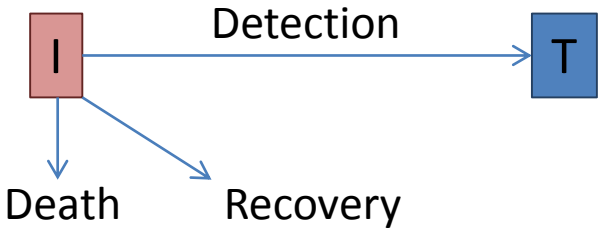
Simulating ACF interventions in high-burden countries - how can we deal with uncertain case detection rates?

James Trauer



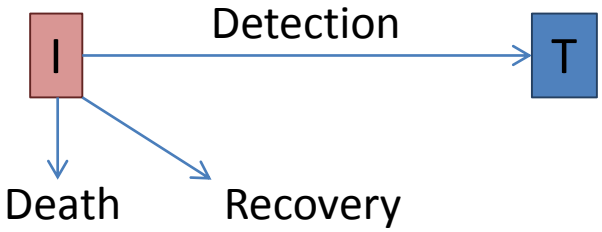


$$CDR = \frac{detection}{detection + death + recovery}$$



$$CDR = \frac{detection}{detection + death + recovery}$$

Known



$$CDR = \frac{detection}{detection + death + recovery}$$

Known

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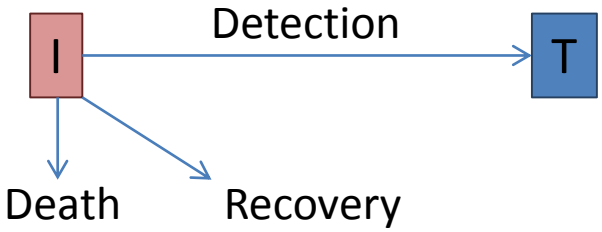
PLoS one

Natural History of Tuberculosis: Duration and Fatality of Untreated Pulmonary Tuberculosis in HIV Negative Patients: A Systematic Review

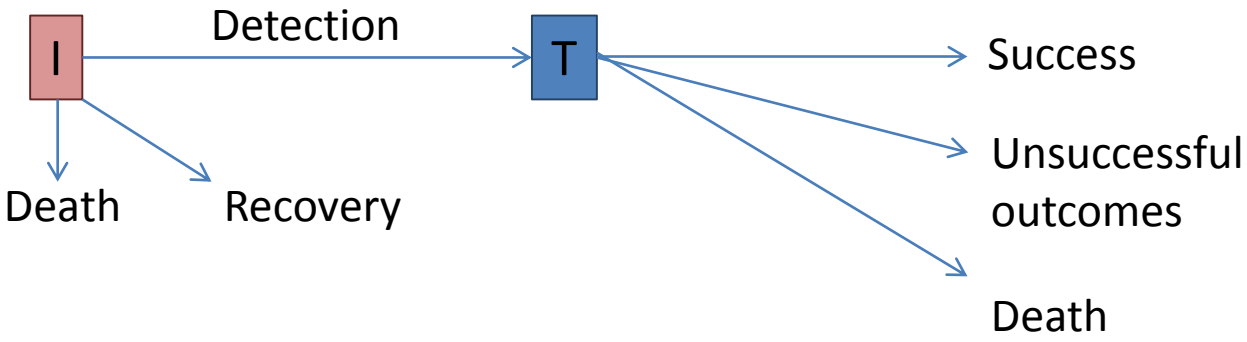
Edine W. Tiemersma[1,2*], Marieke J. van der Werf[1,2], Martien W. Borgdorff[3], Brian G. Williams[4], Nico J. D. Nagelkerke[5]

1 KNCV Tuberculosis Foundation, The Hague, The Netherlands, **2** Center for Infection and Immunity Amsterdam (CINIMA), Academic Medical Center, University of Amsterdam, Amsterdam, The Netherlands, **3** Cluster Infectious Disease Control, Municipal Health Service (GGD) Amsterdam, Amsterdam, The Netherlands, **4** South African Centre for Epidemiological Modelling and Analysis, Stellenbosch, South Africa, **5** Department of Community Medicine, Faculty of Medicine and Health Sciences, UAE University, Al Ain, United Arab Emirates



$$CDR = \frac{detection}{detection + death + recovery}$$

$$\therefore detection = \frac{(death + recovery) \times CDR}{1 - CDR}$$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Success
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WHO GLOBAL TB REPORT 2016

Time to diagnosis

BMC Infectious Diseases

BioMed Central

Research article

Open Access

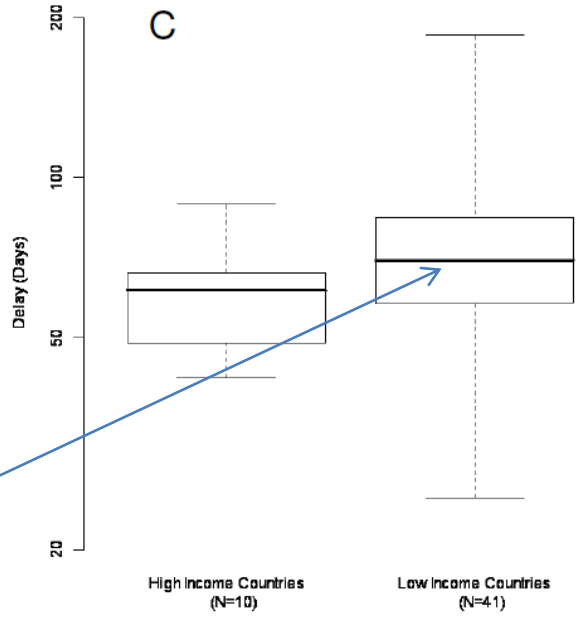
Time delays in diagnosis of pulmonary tuberculosis: a systematic review of literature

Chandrashekhar T Sreeramareddy*[1,5], Kishore V Panduru[2,6], Joris Menten[3] and J Van den Ende[4]

Address: [1]Department of Community Medicine, Manipal Teaching Hospital, Manipal College of Medical Sciences, Pokhara, Nepal, [2]Department of Internal Medicine, Manipal Teaching Hospital, Manipal College of Medical Sciences, Pokhara, Nepal, [3]Department of Public Health, Institute of Tropical Medicine, Antwerp, Belgium, [4]Department of Clinical Sciences, Institute of Tropical Medicine, Antwerp, Belgium, [5]Current address: Department of Community Medicine, Melaka-Manipal Medical College, Jalan Batu Hampar, Bukit Baru, Melaka, Malaysia and [6]Current address: Department of Respiratory Medicine, Ministry of Health, Brunei Darussalam

Email: Chandrashekhar T Sreeramareddy* - chandrashekharats@yahoo.com; Kishore V Panduru - pandu_vki@yahoo.com; Joris Menten - jmenten@itg.be; J Van den Ende - jvdende@itg.be

* Corresponding author

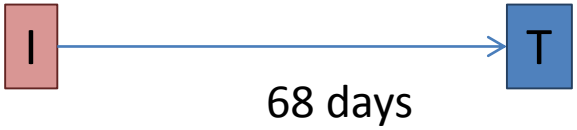


- Median total delay 68 days (IQR 25 to 185 days)
  - Patient delay 5 to 162 days
  - Health system delay 2 to 87 days

Detected

Never detected

Detected



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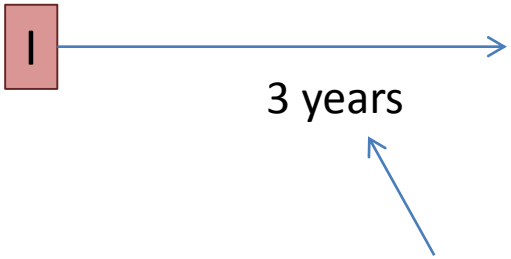

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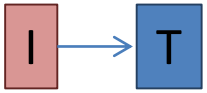

68 days

Never detected

3 years

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PLoS one

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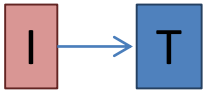


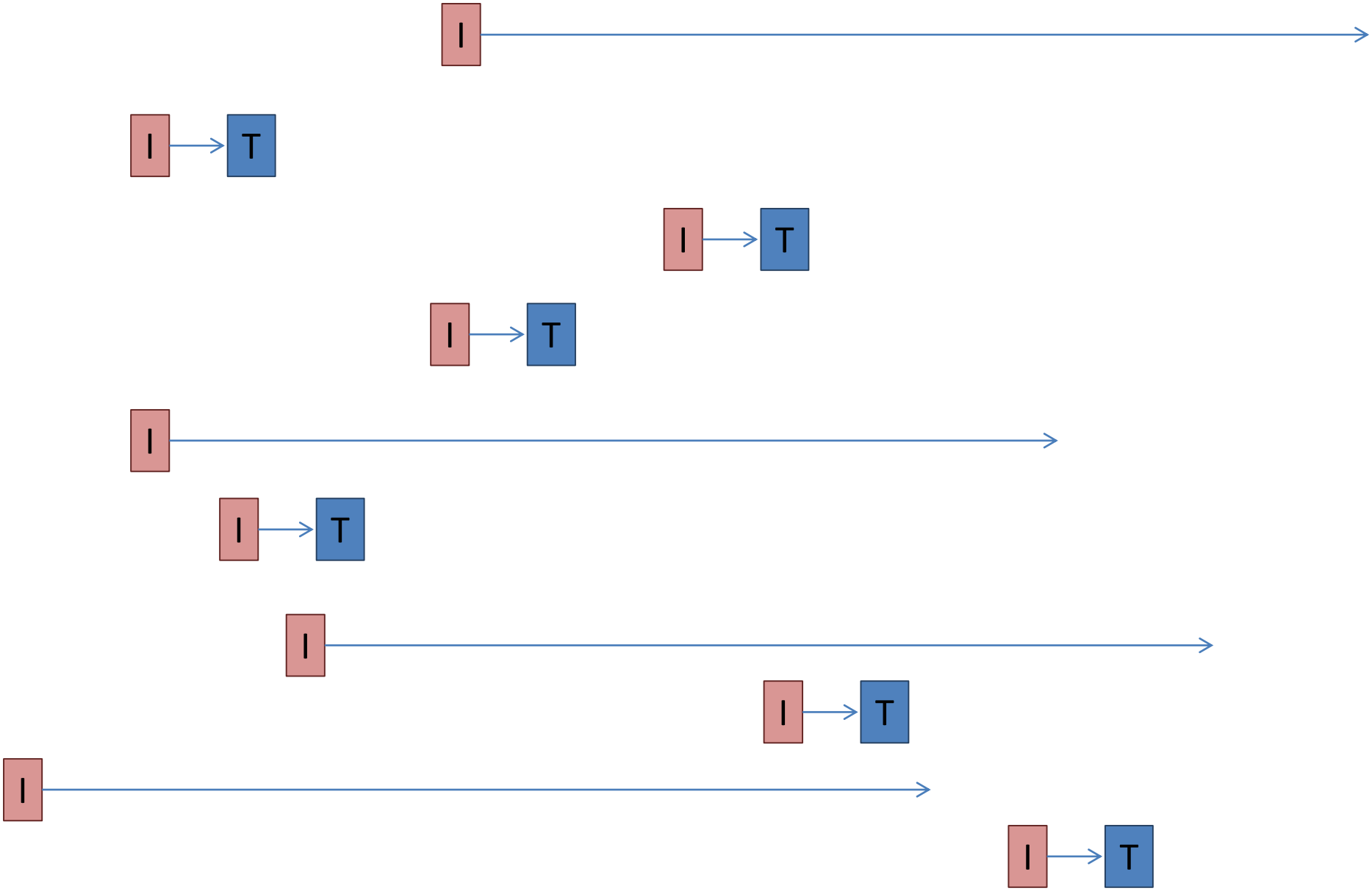
68 days

x 60% → <10% of transmission

Never detected

3 years

x 40% → >90% of transmission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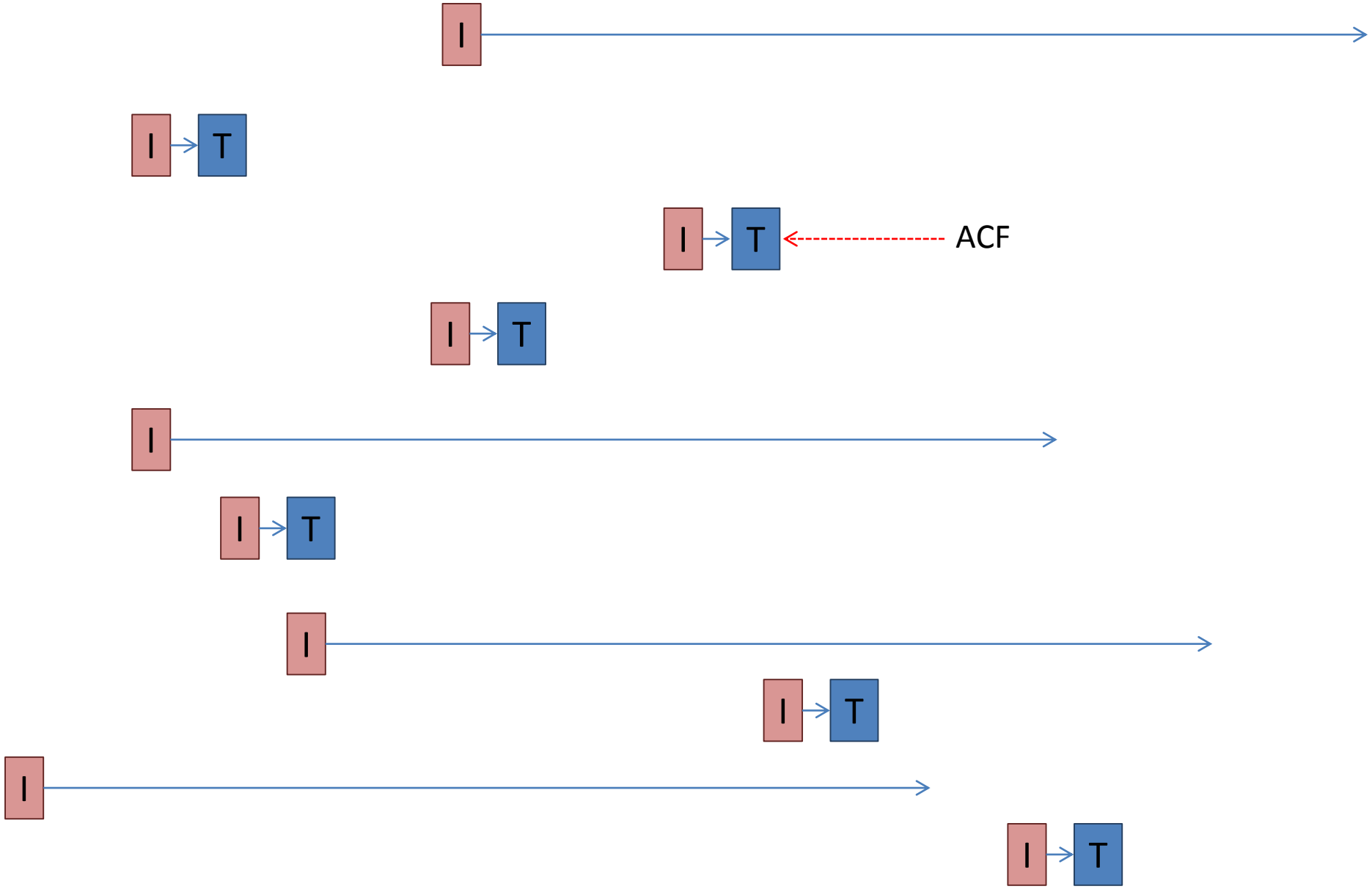
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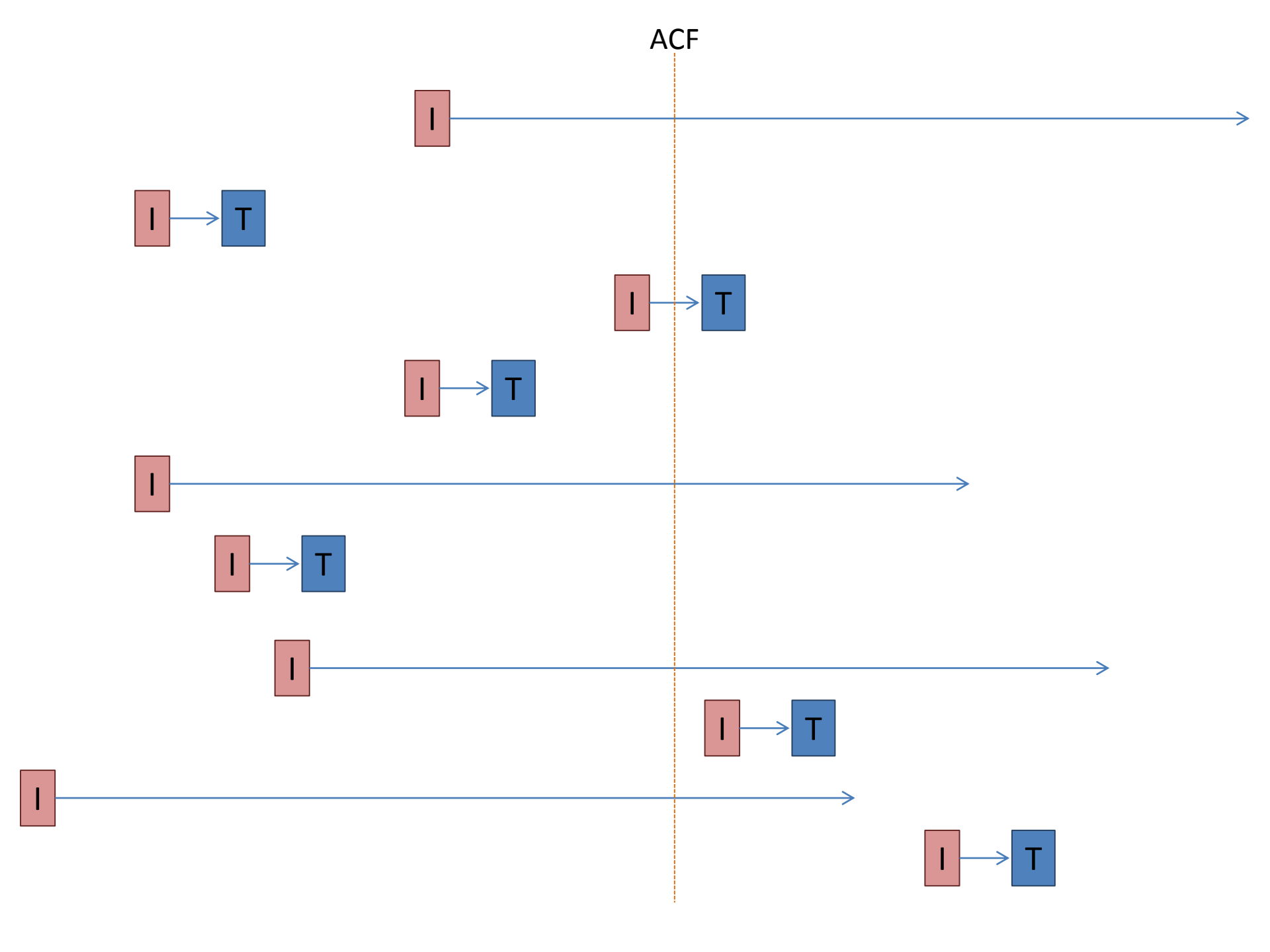
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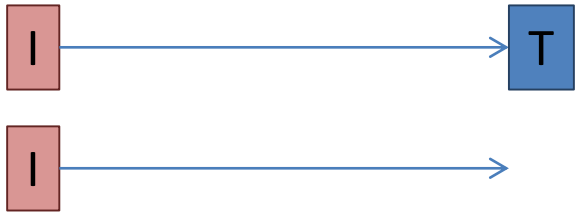

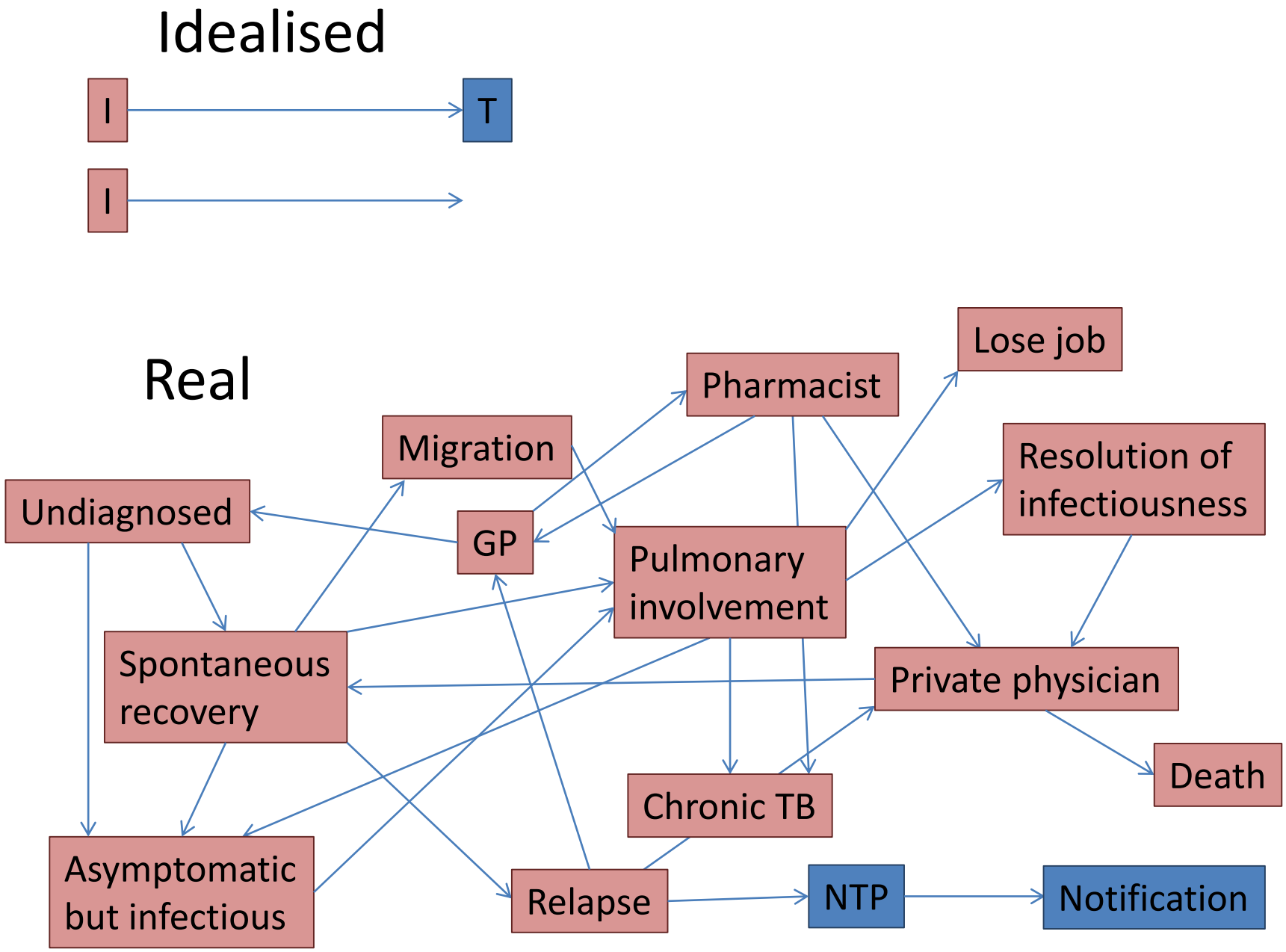
Idealised
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Real
Lose job
Pharmacist
Migration
Resolution of infectiousness
Undiagnosed
GP
Pulmonary involvement
Spontaneous recovery
Private physician
Death
Chronic TB
Asymptomatic but infectious
Relapse
NTP
Notification

Heterogeneities in pre-treatment pathways

- Biological
  - Symptoms
  - Severity
  - Infectiousness
  - Resolution/recovery
- Patient-related
  - Priorities
  - Disability and loss of income
- Health system-related
  - Provider awareness
  - Multiple health systems
  - Access

Conclusions

- Case detection parameter important
- Unknown cases critical
- Mechanism of ACF important
- Models simplify realities of case detection