

Deep reinforcement learning for large-scale epidemic control

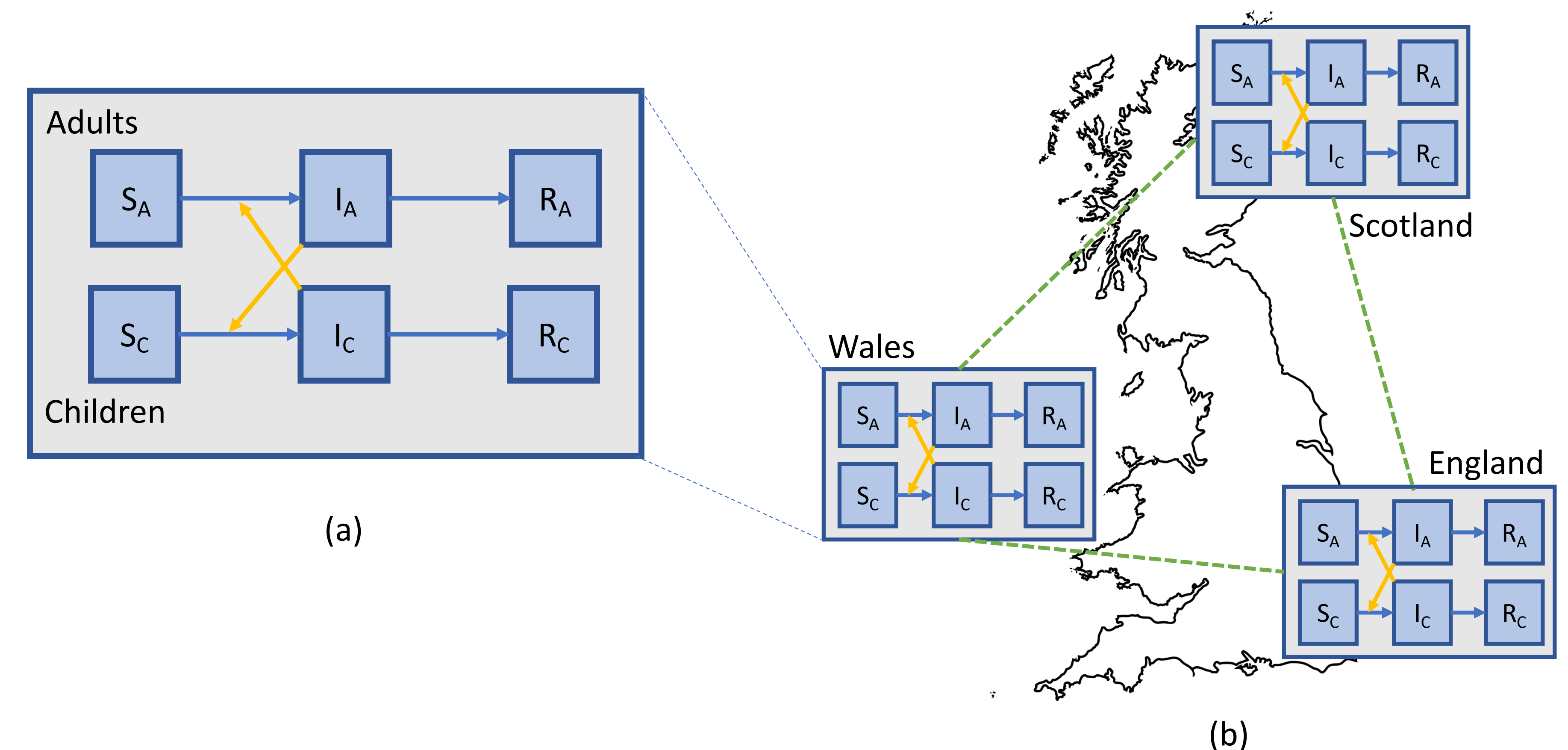
Pieter Libin^{1,2,3} Arno Moonens¹ Timothy Verstraeten¹ Fabian Perez-Sanjines¹ Niel Hens³ Philippe Lemey² Ann Nowé¹

¹Artificial Intelligence Lab, Vrije Universiteit Brussel ²Rega Institute for Medical Research, KU Leuven ³Data Science Institute, Hasselt University

Abstract

- Development of prevention strategies is challenging
- We propose a deep reinforcement learning (RL) approach to automatically learn prevention strategies
- We evaluate our new method to investigate geo-spatial school closure policies in a new meta-population model for pandemic influenza

Meta-population model (simplified)



RL environment

State space:

SEIR for each age group
School closure budget

Action space:

Open/close schools

Reward:

Increment in infections at time t

Results

Joint school closure policy for 11 districts

