Characteristics of SARS-CoV-2 transmission in Australia

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Case Data

SARS-CoV-2 Delta variant case line data of Australian cases recorded from 1 March 2021 to 31 October 2021 were provided by the National Notifiable Diseases Surveillance System (NNDSS), Office of Health Protection, Department of Health, on behalf of the Communicable Diseases Network Australia. Access to the case data requires approval from the Office of Health Protection, Australia Government Department of Health/ Communicable Diseases Network Australia (CDNA) Jurisdictional Executive Group (JEG).

The case line data included values for

Individual_ID	STATE	MAPPED_SEROGROUP_SUBTYPE	LAB_DIAGNOSIS_METHOD
RESIDENT_POSTCODE	RESIDENT_LOCATION	TRUE_ONSET_DATE	NOTIFICATION_DATE
NOTIFICATION_RECEIVED_DATE	SPECIMEN_DATE	AGE_AT_ONSET	SEX
PLACE_OF_ACQUISITION			

File sequence

1. Github_case_sequence_input.m: loads in the case data and sequence information. Adds longitude and latitude to each resident postcode. Also specifies probabilities for time differences, age, age_group, gender, distance.
2. Github_NSW_labs.m: specifies the sites for each pathology provider in NSW. Must also load spreadsheets containing the Lat and Long for each site.
   a. '4Cyte Pathology_Pathology_Coordinates_googleAPI_217_NSW_JM.xlsx'
   b. 'NSW_postcodes_LHD.xlsx'
   c. Austech Medical Laboratories_Coordinates_googleAPI_5_NSW.xlsx'
   d. Australian_Clinical Labs_Coordinates_googleAPI_NSW_377_withDups_JM.xlsx'
   e. 'Douglass_Hanly_Moir_Pathology_Coordinates_googleAPI_208_JM.xlsx'
   f. 'Laverty_Pathology_Coordinates_googleAPI_370_towns_with_dups.xlsx'
   g. 'NSW_Health_Pathology_googleAPI_NSW_157.xlsx'
   h. 'SEALS_Coordinates_googleAPI_46.xlsx'

        i. `'SYDPATH_googleAPI_Australia_24.xlsx'`
3. Github_Westmead_children_link.m: estimate linkages for Westmead hospital
   a. Calls prob_link_child_noany.m
4. Create the link sets for each state/territory:
   a. Github_Links_ACT.m
      i. Calls prob_link_state.m
   b. Github_Links_NSW.m
      i. Calls prob_link_NSW_noany.m
      ii. Github_links_NSW_geo.m: incorporates geo info into the NSW linkage set
         1. Calls prob_link_NSW_geo.m
   c. Github_Links_NT.m
   d. Github_Links_QLD.m
   e. Github_links_SA.m
      i. Calls prob_link_state_SA.m
   f. Github_Links_TAS.m
   g. Github_Links_VIC.m
      i. Calls prob_link_VIC_noany.m
   h. Github_Links_WA.m
5. Github_seq_case_opt.m: run the optimization routine on each state/territory to estimate the optimal linkages between the cases and sequences
   a. Calls bipartite_prob.m to set up the bipartite problem
6. Github_all_matches.m: collect all matches across the states
7. Github_LHD_trans_MC.m: load in the Local Health District information for NSW.
   a. Calls NSW_postcodes_LHD.xlsx
8. Github_aligned_clone2seqs_linked_all_geo_shortb_MC.m: Connect the linked cases to the nodes in the transmission networks, running Monte Carlo on within-clone network calculations over the ranges of age and distance preference.
   a. Calls clone2seqs_geo.m: to generate network of sequences from network of clones
      i. Calls within_clone_network_geo.m: generates the optimal network within a given clone for a set value of lama and lamd.
         1. Calls CLE_optimal.m
            a. Calls CLE_calc1.m
9. Github_analyse2b_MC.m: analyse the MC results.