Introduction and Background

- Distributed research networks are increasingly being used to facilitate comparative safety and effectiveness research and support public health surveillance activities.1-4
- PopMedNet is a scalable and extensible information platform designed to facilitate the implementation and operation of distributed health data networks.1-6
- PopMedNet supports a range of distributed networks, including the FDA Sentinel, NIH Health Care Systems Research Collaboratory Distributed Research Network (DRN), MDPHnet, HCSRNnet, CRNet, and PCORnet.1-4
- Distributed research networks use different governance models that require systems to address issues such as:
  - Interactions between coordinating centers, investigators, and data partners.
  - Access controls and permission to manage users and activities within a network.
  - Facilitation of workflows and implementation of local governance policies.
- PopMedNet is a common infrastructure that can support multiple networks with unique governance models, enabling networks to:
  - Define their structure and governance.
  - Mitigate privacy and security concerns of participants via strict access restrictions.
  - Enable custom workflows for participants.1,4
- PopMedNet has a flexible and granular access control system to create and operate distributed research networks with highly customized configurations and permissions.

Number of requests and entities in PopMedNet networks:

<table>
<thead>
<tr>
<th>Network Type</th>
<th>Network Requests</th>
<th>Organizations</th>
<th>DataMarts</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-Sentinel</td>
<td>1457</td>
<td>29</td>
<td>28</td>
<td>178</td>
</tr>
<tr>
<td>MDPHnet</td>
<td>857</td>
<td>5</td>
<td>7</td>
<td>87</td>
</tr>
<tr>
<td>PCORnet</td>
<td>458</td>
<td>124</td>
<td>102</td>
<td>278</td>
</tr>
<tr>
<td>NIH Collaborative DRN</td>
<td>205</td>
<td>21</td>
<td>21</td>
<td>67</td>
</tr>
</tbody>
</table>

*As of 08/2015, inclusive of test request and entities

Innovation

- Providing the ability to create custom network configurations
  - Define relationships between entities.
  - Efficiently configure settings across network entities – entities are organized in a hierarchy – permissions applied to parent entities are inherited by their children.

The PopMedNet access control system is a hierarchical, role-based system

Enabling networks to define custom roles
- Administrators define permissions for custom roles as they apply to specific entities within the network.
- Permission: Allows an action within or upon an entity. Granted to a security group.

Project Permission Page
- Security group: A collection of permissions that may be assigned to a user. Named as “Organization or Project role”, e.g., “FDA Sentinel/Enhanced Investigator”.
- Role: A defined position fulfilled by one or more users.

Standard PopMedNet Roles:

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Administrator</td>
<td>Create network entities, manage access controls, approve/create users.</td>
</tr>
<tr>
<td>Project Administrator</td>
<td>Create network entities, manage access controls, approval requests.</td>
</tr>
<tr>
<td>Observer</td>
<td>View and audit network/project activity, excluding results.</td>
</tr>
<tr>
<td>Enhanced Observer</td>
<td>View and audit network/project activity, including result details.</td>
</tr>
<tr>
<td>DataMart Administrator</td>
<td>Review and respond to DataMart(s).</td>
</tr>
<tr>
<td>Response Reviewer</td>
<td>Review responses for specific DataMart(s) before release to Investigator.</td>
</tr>
</tbody>
</table>

Discussion

- The PopMedNet access control system provides a high degree of network customization. As governance policies at the network level or at local sites change, the system configuration can be changed on demand.
- Standard roles and configurations are recommended for ease of administration and consistency across networks.
- Balancing granularity, complexity, and user experience is a challenging design consideration.
- Implementations have shown that the system helps mitigate network participants’ concerns regarding who has permission to query them and the privacy of their participation and data.

Conclusion

- A flexible, granular access control system is a critical component of any distributed network.
- PopMedNet has been used to configure multiple large-scale distributed research networks. As these networks grow and evolve, their access controls may be modified to support new configurations, workflows, or governance decisions.
- Enhancements are planned to improve the usability of the system for administrators and to provide additional workflow options for network participants.

References