Data Construction Appendix

Data Sources: All data sources upon which this project relies are regularly collected administrative health encounter data housed at the Institute for Clinical Evaluative Sciences (ICES). The following data set are used in this study.

1) CAPE: The Client Agency Program Enrolment database tracks patient enrolment to individual family physicians.
2) DAD: The Discharge Administrative Database supplies information on acute care hospitalizations
3) IPDB: ICES Physician Database contains annual demographic data for physicians as well as information on areas of specialization and workload.
4) NACRS: The National Ambulatory Care Reporting System provides information on all emergency room encounters.
5) OHIP: The Ontario Health Insurance Program billing claims system captures provision of care to patients.
6) PCCF+: Statistics Canada’s Postal Code Conversion File allows patients to be attributed to a census dissemination area based on postal code.
7) RPDB: The Registered Person’s Database captures patient demographic information, including age, sex and postal code.
Data Linkage – Graphical Summary:

- Physician CPSO number
  - IPDB
  - OHIP + CAPE
    - Patient Roster
      - OHIP + NACRS + DAD
        - Economic Profile
          - RPDB + PCCF
          - Subgroup with or at risk of CVD
            - Hospitalizations
              - DAD
            - RPDB
              - Socio-Demographic
Summary of Algorithms used to identify patients with CVD

### Coronary Artery Disease (CAD)

| Data Sources | DAD/SDS (April 1988 forward)  
|              | NACRS (SDS only) (F2003-04 forward)  
|              | OHIP (July 1991 forward) |
| Case Ascertainment | 1 hospital admission with a CAD diagnosis code, or 1 CAD OHIP billing code |
| Codes Used | Acute myocardial infarction 1  
|            | ICD-9: 410  
|            | ICD-10: I21, I22, I252, I513  
|            | Percutaneous coronary intervention 2  
|            | prcode: 4802, 4803, 4809  
|            | incode: 1IJ50, 1IJ57GQ, 1IJ57GS  
|            | Coronary artery bypass graft surgery 2  
|            | prcode: 481  
|            | incode: 1IJ76  
|            | Cardiac catheterization  
|            | prcode: 4892, 4893, 4894, 4895, 4896, 4897, 4898, 4995, 4996, 4997  
|            | incode: 3IP10  
|            | OHIP billing codes: Z442 or G297 |
| Notes | Definition from Tu et al. 3 |

### Cerebral Vascular Disease (CVD)

| Data Sources | DAD/SDS (April 1988 forward)  
|              | NACRS (SDS only) (F2003-04 forward) |
| Case Ascertainment | 1 hospital admission with a CVD diagnosis code |
| Codes Used | ICD-9: 430, 431, 432, 434, 436 (any type)  
|            | ICD-10-CA: I63, I64, G46, G45, H34 (any type) |

### Ontario Diabetes Database (ICES Derived Cohort)

| Case Ascertainment (Bridge) | 1 or 2 OHIP dxcode claims prior to 19th birth date AND  
|                            | 1 OHIP claim after 19th birth date within 2 years  
|                            | (19th birth date is used as incident date) |
| Case Ascertainment (Adult) | 2 OHIP dxcodes OR  
|                            | 1 OHIP feecode OR  
|                            | 1 CIHI admission after 19th birth date |
## Data Sources

<table>
<thead>
<tr>
<th>OHIP (July 1991 forward)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAD/SDS (April 1988 forward)</td>
</tr>
<tr>
<td>NACRS (SDS only) (F2003-04 forward)</td>
</tr>
</tbody>
</table>

## Codes Used

<table>
<thead>
<tr>
<th>ICD-9: 250 (any type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD-10-CA: E10, E11, E13, E14 (any type)</td>
</tr>
<tr>
<td>OHIP dxcode: 250</td>
</tr>
<tr>
<td>OHIP fee code: Q040, K029, K030</td>
</tr>
</tbody>
</table>

## Notes

- Gestational Diabetes records excluded
- Incidence not reported for first 3 years

## Renal Failure

### Case Ascertainment

- Any one of the 2 OHIP diagnosis codes or 9 ICD-9/ICD-10 codes within the 5 years prior to cohort entry without kidney transplant within the previous five years and without dialysis within the previous 1 year.

### Data Sources

<table>
<thead>
<tr>
<th>DAD/SDS (April 1988 forward)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NACRS (SDS only) (F2003-04 forward)</td>
</tr>
<tr>
<td>OHIP (July 1991 forward)</td>
</tr>
</tbody>
</table>

### Inclusion Codes Used

| ICD-9: 4030, 4031, 4039, 4040, 4041, 4049, 585, 586, 5888, 5889, 2504 (any dxcode) |
| ICD-10-CA: E102, E112, E132, E142, I12, I13, N08, N18, N19 |
| OHIP: 403, 585 |

### Exclusion Codes Used

<table>
<thead>
<tr>
<th>Kidney Transplant:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD-9: V420, 99681</td>
</tr>
<tr>
<td>CCP: 6743, 675</td>
</tr>
<tr>
<td>ICD-10: T861, N165, Z940</td>
</tr>
<tr>
<td>CCI: 1PC85</td>
</tr>
<tr>
<td>OHIP: E762, E769, E771, G347, G348, G408, G409, G412, S434, S435, Z631</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dialysis Codes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD-9: E1022, E1023, E1122, E1123, E1322, E1323, E1422, E1423, N180, T824, Y602, Y612, Y622, Y841, Z49, Z992</td>
</tr>
<tr>
<td>CCP: 5127, 5142, 5143, 5195, 6698</td>
</tr>
<tr>
<td>ICD-10: V451, V560, V568, 36104</td>
</tr>
<tr>
<td>CCI: 1PZ21, 1OT53DATS, 1OT53HATS, 1OT53LATS, 1SY55LAFT, 75C59QD, 1KY76</td>
</tr>
</tbody>
</table>

### Notes

- From Fleet JL et al

## Peripheral Vascular Disease (PVD)
| **Case Ascertainment** | • 1 hospital admission with a PVD intervention code **AND**  
• Without specified diagnosis codes on the same abstract |
| **Data Sources** | DAD/SDS (April 1988 forward)  
NACRS (SDS only) (F2003-04 forward) |
| **Codes Used** | Major:  
• CCP: 96.14, 96.15  
• CCI: 1VQ93, 1VC93, 1VG93  
Minor:  
• CCP: 96.11, 96.12, 96.13 **WITHOUT**  
  • ICD-9: 170, 171, 213, 730, 740-759, 800-900, 901-904, 940-950 **on the abstract**  
• CCI: 1WL93, 1WA93, 1WE93, 1WJ93, 1WM93 **WITHOUT**  
  • ICD-10-CA: C40, C41, C46.1, C47, C49, D160, M46.2, M86, M87, M89.6, M90.0-M90.5, Q00, Q38-Q40, S02.0, S04.0 S09.0, S15, S25, T26 **on the abstract**  
Bypass:  
• CCP: 51.25, 51.29, 50.18 ICD9 **WITHOUT**  
  • ICD-9: 4141, 441, 442 **on the abstract**  
• CCI: 1KG50, 1KG57, 1KG76, 1KG35HAC1, 1KG35HHC1 **WITHOUT**  
  • ICD-10-CA: I67.1, I71, I72, I60, I77.0, I79.0, Q codes **on the abstract** |
| **Hypertension (ICES Derived Cohort)** | • 1 hospital admission with a hypertension diagnosis code **OR**  
• 1 OHIP record with a hypertension diagnosis code, followed within 2 years by another OHIP record or a hospital admission with a hypertension diagnosis code |
| **Data Sources** | OHIP (July 1991 forward)  
DAD/SDS (April 1988 forward)  
NACRS (SDS only) (F2003-04 forward) |
| **Codes Used** | ICD-9: 401x, 402x, 403x, 404x, 405x (any type)  
ICD-10-CA: I10, I11, I12, I13, I15 (any type)  
OHIP dxcode: 401, 402, 403, 404, 405 (any type) |
| **Notes** | Gestational hypertension records excluded  
Generic exclusions do not apply to this cohort |

**References**

1) Austin PC1, Daly PA, Tu JV. A multicenter study of the coding accuracy of hospital discharge administrative data for patients admitted to cardiac care units in Ontario. Am Heart J 2002;144(2):290-6.


