

# Blood Donation-Related Nerve Injury: A National Retrospective Review

Anani, Waseem<sup>1,2</sup>; Petraszko, Tanya<sup>1,3</sup> Goldman, Mindy<sup>1,4</sup>

<sup>1</sup>Medical Services & Hospital Relations, Canadian Blood Services, <sup>2</sup>Department of Laboratory Medicine and Pathobiology, University of Toronto

<sup>3</sup>Department of Medicine, University of British Columbia, <sup>4</sup>Department of Pathology and Laboratory Medicine, University of Ottawa

## Background

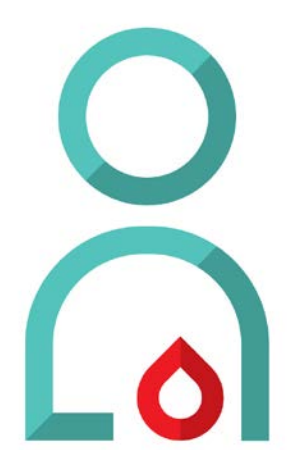
- Blood donation can infrequently lead to adverse events
- Phlebotomy-induced nerve injuries are a rare complication that can take weeks to months to resolve
- They occur when the needle injures nearby nerves by direct contact causing neuropathic pain and inflammation
- Rates of phlebotomy-induced nerve injury in Canadian donors range from 4-22 per 100,000<sup>1-3</sup>

## Methods

- Donor reaction data from January 2013 to December 2020 were collected from IBM Cognos Software
- Data were compiled from all Canadian provinces except Quebec
- Collected data: donor demographics, age by decade, donation type, and donor appointment-related information
- Nerve injuries were reported as at the donor clinic (immediate) or after donation (delayed)

## Results

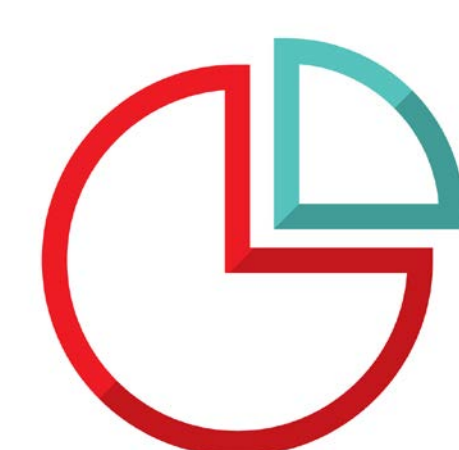
Over 8 years



7,354,496  
donations



43,249  
donor reactions



2,707 (0.036%)  
nerve injuries

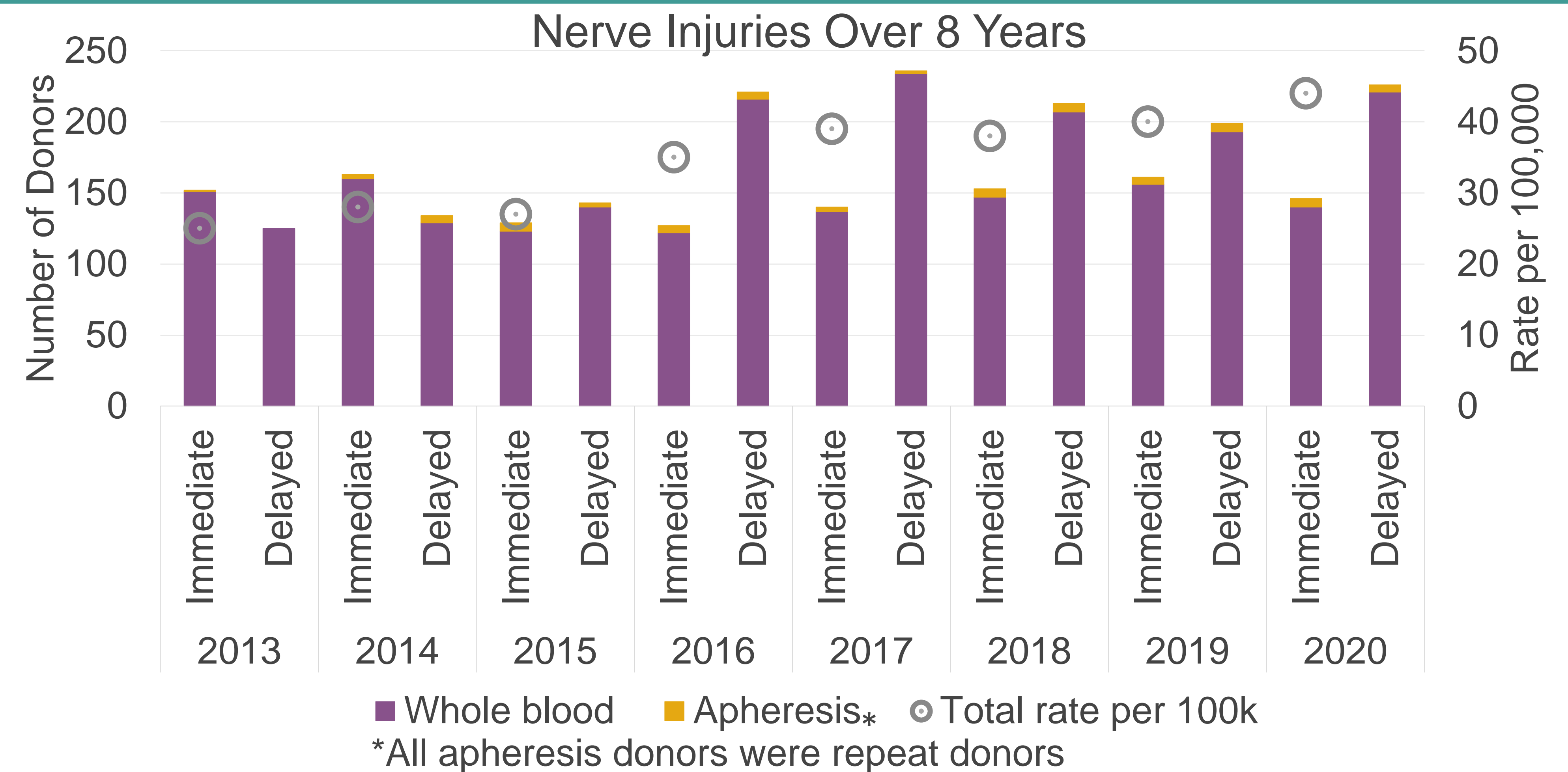


Men: 16 per 100,000  
Women: 25 per 100,000

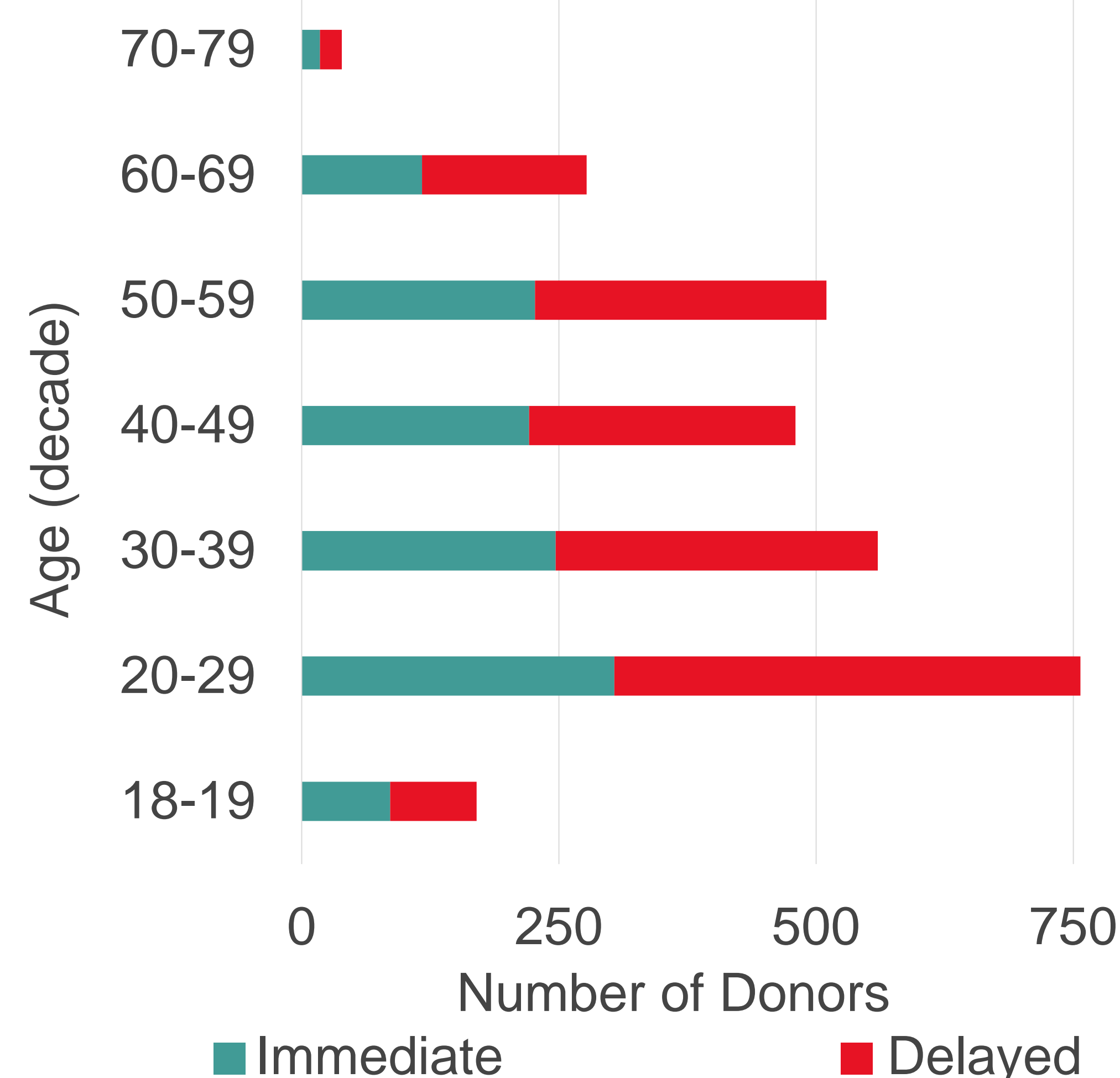


Nerve injury per 100,000 donor  
New – 56 whole blood  
Repeat – 38 whole blood  
39 plasmapheresis  
19 plateletpheresis

## Results



## Nerve Injuries By Age



## Average Annual Donor Attendance and Nerve Injury per 100,000 Rate

Location	Donor Attendance	Nerve Injury
1	51,780	20
2	170,244	22
3	51,148	27
4	68,856	28
5	94,540	32
6	85,946	33
7	20,246	33
8	37,113	35
9	55,955	37
10	147,180	43
11	97,805	43
12	93,578	44
13	19,573	59

## Conclusion

- Increasing trend of donor nerve injuries over 8 years
- Immediate pain is a common response when phlebotomy needles injure a nerve. First-time donors and women were more likely to experience nerve injuries and have immediate pain at the time of donation.
- Canadian nerve injury rates align with previously published data and show an increasing trend of nerve injuries. Donor anatomy, needle gauge, and phlebotomy techniques are the major factors in eliciting a nerve injury.
  - Regional nerve injury rates may reflect local variations in phlebotomy techniques
  - Some individuals have anatomy more prone to nerve injury. The Canadian population may be more prone to nerve injuries due to the anatomical placement of the nerve in relation to the blood vessel.<sup>4</sup>

1. Berry PR, Wallis WE. *Lancet*. 1977;1(8024):1236-1237.  
 2. Newman BH, Waxman DA. *Transfusion*. 1996;36(3):213-215.  
 3. Horowitz SH. *Pain*. 2001;94(3):225-229.  
 4. Horowitz SH. *Transfusion*. 2000;40(9):1036-1040.