Data on Death Registrations Illustrates Issues with Ontario's Records Maintenance*

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First sentence. Second sentence. Third sentence. Fourth sentence. - The abstract should be three or four sentences. The abstract must tell the reader the top-level finding. What is the one thing that we learn about the world because of this paper?

Introduction

two or three paragraphs of content. and there should be an additional final paragraph that sets out the remainder of the paper

You can and should cross-reference sections and sub-sections. For instance, Section @ref(data). Quarto automatically makes the sections lower case and adds a dash to spaces to generate labels, for instance, Section @ref(first-discussion-point).

During the period of 2011 and 2020, it is estimated that on average just under 100 thousand people died each year in Ontario, Canada (Statistics Canada n.d.). The province of Ontario represents the location of a large portion of deaths in Canada as it takes on an estimated 37% of all deaths in Canada from 2011-2020 (Statistics Canada n.d.). From 2011 to 2020, the population in Ontario has grown from over 13 million to just under 15 million (Statistics Canada n.d.). Significantly, the city of Toronto makes up approximately 44% of the population of Ontario (Statistics Canada n.d.).

In this paper I will be analyzing death registry data from four civic centers in the greater Toronto area, Etobicoke, North York, and Scarborough. First, I will compare rates of death

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registration from these civic centers over the period of 2011-2020. Next, I will compare rates of death registration against place of death in order to discuss the rate of deaths inside and outside the Toronto city limits. Finally, I will discuss trends in death registrations from each civic center.

Data

data section should thoroughly and precisely discuss the source of the data and the bias this brings (ethical, statistical, and otherwise). comprehensively describe and summarize the data using text, graphs, and tables must be made iwth knitr or gt. graphs must show the actual data, or as close to it as possible, not summary statistics. (Graphs and tables should be cross-references in the text e.g., 'Table 1 shows…')

Analysis for this paper utilizes R the statistical programming language (R Core Team 2020), along with several packages. These packages are, tidyverse (Wickham et al. 2019), janitor (Firke 2021), and dplyr (Wickham et al. 2022). The data I am analyzing come from Open Data Toronto and it is imported using the opendatatoronto package (Gelfand 2022). **

All figures in this paper have been created using ggplot2 (Wickham 2016) and the tables have been created with knitr (Xie 2023) and kableExtra (Zhu 2021), packages. The color styles in my graph were created by using the RColorBrewer (Neuwirth 2022) package and any graph combinations were made using the Patchwork (Pedersen 2022) package.**

The data I am analyzing comes from Registry Services staff located in three of the civic centers (Etobicoke, North York, Scarborough) and

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"This dataset includes information relating to the registration of deaths documented by Registry Services staff located in four of the civic centres (Scarborough, North York, Toronto and Etobicoke). Registration of death data is entered into the Registry Services Tracking System (RSTS), from which aggregate statistical information is generated to create the dataset. The dataset resides in an Oracle database in the City's environment.

The data I am analyzing comes from death registrations which are entered into the Registry Services Tracking System (RSTS) by Registry Services staff located at three of the civic centres (Etobicoke, North York, Scarborough) .

Open Data Toronto (2023)

The dataset is created in support of the Vital Statistics Act, which is a Provincial legislation. The dataset also supports the City's operational requirements and business functions." (Gelfand 2022)

"_id = unique row identifier for Open Data database

civic_centre = civic centre code

death licenses = number of deaths registered in the month

place_of_death = place where death occurred

time_period = month death registered" (Gelfand 2022)
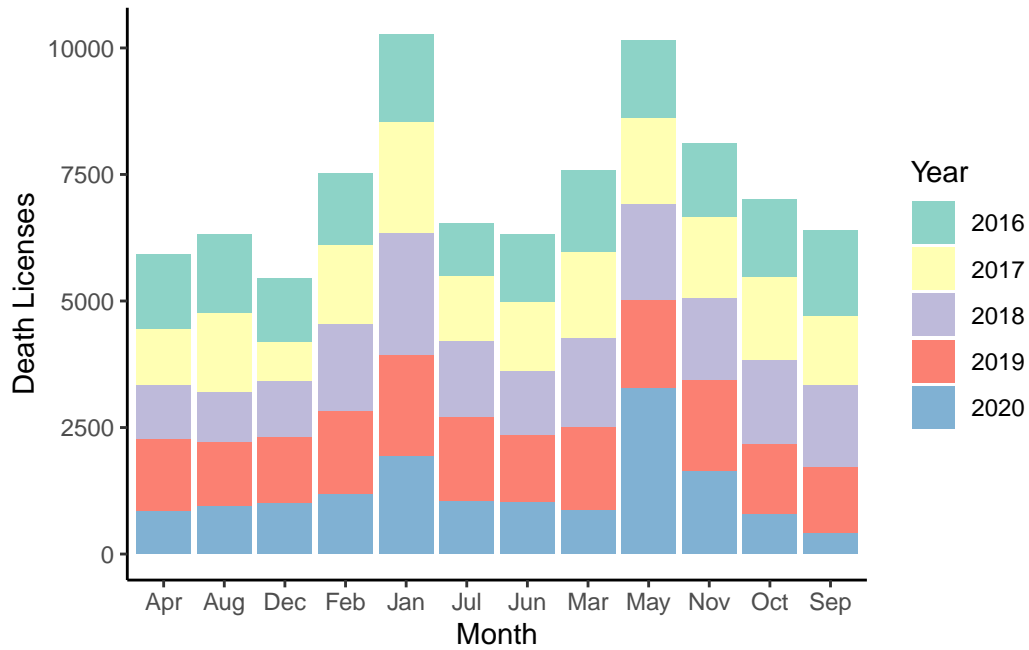
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(1)

Figure 1: Death Licenses Given Out by Month from 2016-2020 at Three Toronto Civic Centres
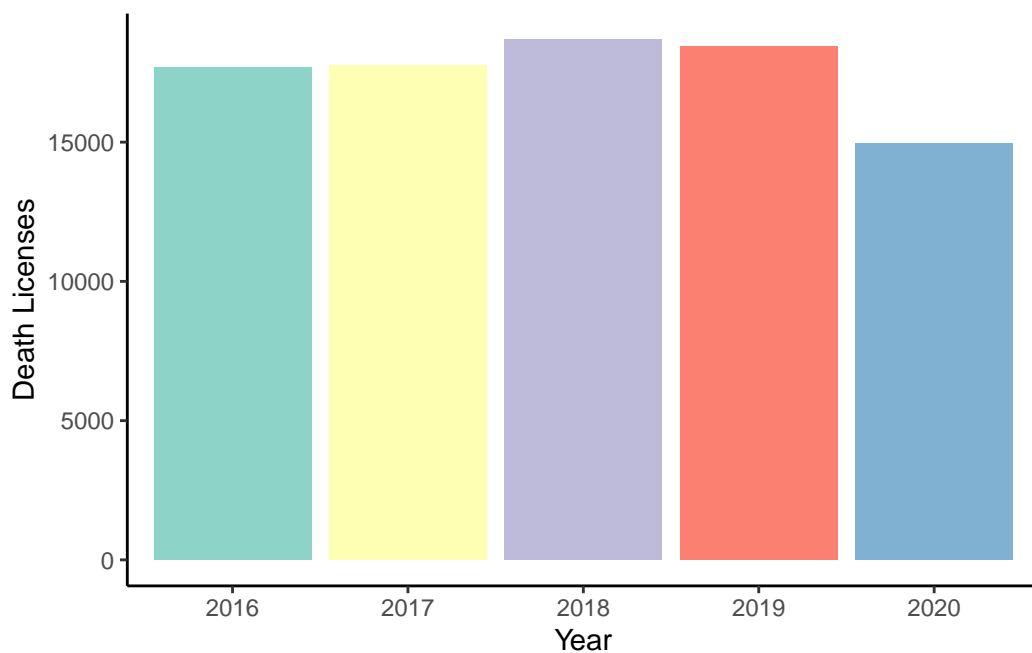
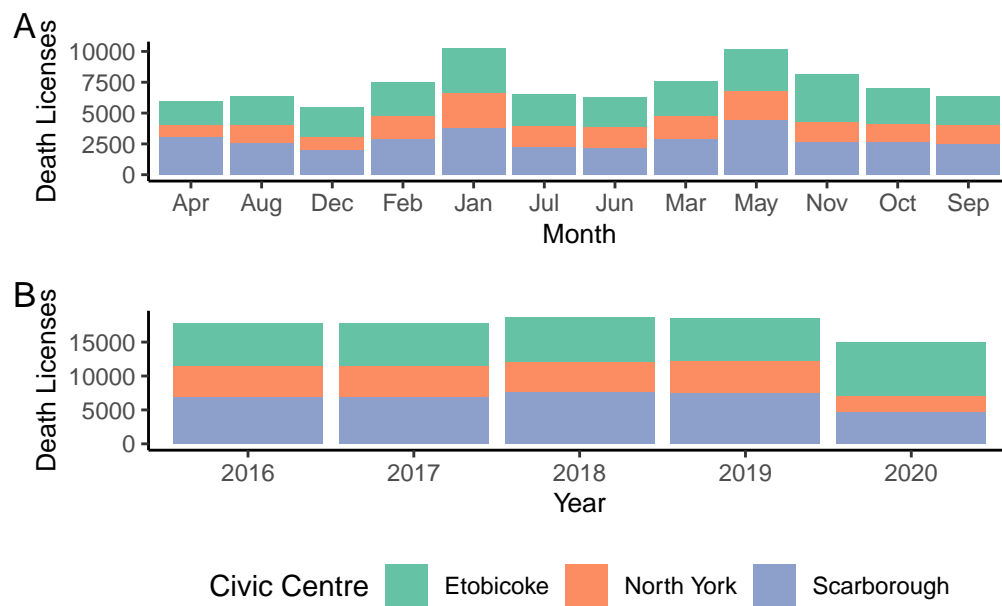Figure 2: Death Licenses Given Out by All Civic Centres Yearly From 2016-2020

Figure 3: Death Licenses Given Out by Each Civic Centre Yearly and Monthly Over the Period of 2016-2020

Table 1: Average Number of Deaths Per Month from 2016-2020 at Etobicoke Centre

Month	Average Number of Deaths				
	2016	2017	2018	2019	2020
Apr	236	209	211	237	273
Aug	241	239	211	230	210
Dec	229	209	233	228	217
Feb	264	276	275	259	250
Jan	342	360	372	346	358
Jul	223	250	263	275	235
Jun	236	238	235	253	196
Mar	275	281	285	269	237
May	315	320	329	320	403
Nov	348	351	340	356	280
Oct	281	275	275	278	226
Sep	248	225	251	236	185

Table 2: Average Number of Deaths Per Month from 2016-2020 at Scarborough Centre

Month	Average Number of Deaths				
	2016	2017	2018	2019	2020
Apr	273	262	261	268	299
Aug	275	279	252	271	288
Dec	214	184	199	203	272
Feb	266	269	272	289	262
Jan	350	366	376	371	359
Jul	253	248	263	253	274
Jun	214	214	201	206	223
Mar	275	281	273	284	244
May	382	396	409	382	419
Nov	246	256	265	261	301
Oct	256	264	258	244	226
Sep	252	243	244	236	195

Table 3: Average Number of Deaths Per Month from 2016-2020 at North York Centre

| Month | Average Number of Deaths | | | | |
	2016	2017	2018	2019	2020
Apr	184	164	155	180	189
Aug	199	195	165	172	186
Dec	165	139	151	184	189
Feb	210	214	236	222	193
Jan	291	323	330	303	293
Jul	176	186	194	211	209
Jun	194	193	199	179	180
Mar	224	221	235	225	182
May	246	250	259	268	372
Nov	194	200	204	220	233
Oct	183	192	205	176	160
Sep	198	181	194	170	135

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