Toronto is Accommodating More People and Increasing Shelter Space Every Year*

Syed Hassan

21 April 2023

The city and the people of Toronto provide shelter to thousands of people in need. The users within these shelters are mainly people without homes. The number of daily users within the existing shelters is increasing drastically, with the most active regions located in the central district of Toronto. In addition to creating more space in the existing facilities, the city needs to create more shelters and improve living conditions.

Table of contents

1 Introduction **2**

2 Data **3**
2.1 Source . . . 3
2.2 The Data Set . . . 3
2.3 Methodology . . . 3

3 Results **4**
3.1 The Number of Shelter and Users by City Districts. . . . 4
3.2 The Number of Shelter Users by Program. . . . 6
3.3 The Number of Shelter Users by Sector. . . . 7

4 Discussion **8**
4.1 The Unequal Distribution of Shelters Can Be Problematic. . . . 8
4.2 The City's Progress in Accommodating More People. . . . 8
4.3 The Increasing Number of Users in Specific Sectors. . . . 9

*Code and data are available at: https://github.com/saiyedgh/Shelters_Toronto.git

5 Limitations **9**
5.1 The Case of Increased Users with Limited Shelters, and the Living Conditions. 9
5.2 Empathy with the User 9
5.3 The Changing Programs and Sectors. 10

6 Appendix **11**
6.1 Code 11

References **12**

1 Introduction

Homelessness is a genuine concern of the city and the people of Toronto. The city has acquired plenty of permanent and temporary shelters to provide better housing and overnight shelters for people without homes as well as others seeking emergency housing. The city of Toronto, like many other metropolitan cities, has suffered from the problem of homelessness for years. However, the role of the shelters in helping people without homes might go unnoticed because of the increasing numbers living on the streets.

The city has made good progress in providing more living space for people in need of shelters. It has done that by managing the existing shelters in a way that increases the living space and serves more people. Due to this approach, the number of people using the shelter service has increased. Although the daily average of users has risen, the number of shelters, in fact, has decreased (Section 3).

Interestingly, most of the shelters are located in the central district of Toronto. Other populous districts, such as Scarborough and North York, do not have a proportionate number of shelters. Therefore, the central district of Toronto is responsible for serving the majority of users and has witnessed a great increase in 2022 from the previous year (Section 3).

The number of users has increased in all programs including the overnight shelter, the refugee response, and the winter programs. Similarly, the sectors for families, mixed adults, and men have also attracted more users, except the sectors for women and youth (Section 4).

The increase in the number of people, however, is without the increase in the number of shelters – indicating a possibility of overcrowding and raising concerns about the living conditions. The goal of the shelter program should not only be to accommodate more people but also to improve the conditions within these shelters (Section 5).

2 Data

2.1 Source

The data set is obtained from Opendatatoronto (Gelfand 2022), which focuses on daily shelter provided by the city and charities in Toronto. The overnight service keeps a record of the daily users accessing the shelter service with capacity and other important information. The data identifies the unique locations, the organizations involved, the various districts of the city, the types of programs, and the sector of the shelters.

The data set is fairly new and limited because it was initiated in the year 2021. Despite the limited years of data, it is updated and maintained frequently, having a gold status on the platform. The data set does not explicitly incorporates homelessness in its variables. However, according to the database glossary and description, the main users of the shelter service are predominantly the homeless (*Glossary: Housing Stability Service System Overview* 2023).

2.2 The Data Set

Table 1: An overview of the data set.

location id	occupancy date	district	program	sector	# of daily users
1103	2022-01-01	North York	COVID-19 Response	Men	49
1103	2022-01-01	North York	COVID-19 Response	Mixed Adult	18
1103	2022-01-01	North York	COVID-19 Response	Women	18
1051	2022-01-01	Toronto	Base Shelter and Overnight Services System	Mixed Adult	8
1114	2022-01-01	North York	COVID-19 Response	Families	294
1114	2022-01-01	North York	Temporary Refugee Response	Families	336

The above data set shows the selected variables that will be used for the report. The locations have unique ids that will help us identify the unique shelters. The occupancy date information will help us plot the results over the period of months and years. Additionally, the city districts, programs, and sectors will help us understand the demographics, shelter types, and the specific target audience of the shelters respectively. Lastly, the daily user count will be our primary variable for analyzing the user count in relationship with all the selected variables.

2.3 Methodology

The data set allows us to seek insights related to the last two years. Therefore, the paper will include comparisons across 2021 and 2022. Because the design of the data set is based on the daily service, the daily statistics will be used to measure growth or decline in numbers. The

analysis will also incorporate the different programs and sectors that the shelters serve and their trends and change over time. The data extraction and visualization will help the overall analysis by providing statistical and semantic insights about the operations of the shelters. Due to the majority of shelters having a homeless user base, the report will try to estimate how increasing the number of shelters can help accommodate the homeless population.

Due to the majority of shelters having a homeless user base, the report will try to estimate how increasing the number of shelters can help accommodate the homeless population. Another noticeable and influencing factor in the shelter data is the addition of *Covid-19* related programs that might affect the overall numbers. Hence, the analysis will aim to highlight and distinguish between the regular and *Covid-19* related programs wherever possible.

3 Results

3.1 The Number of Shelter and Users by City Districts.

The city of Toronto is divided into four major districts: Toronto (York, Old Toronto, and East Toronto), North York, Scarborough, and Etobicoke (*Community Council Area Profiles*, n.d.). The data set also includes the new region of Vaughan. Using the district information, we can analyze the number of shelter users based on these regions.

Table 2: Total number of shelters in the city of Toronto with average daily users - 2021.

District	**Shelters**	**Users**
Etobicoke	2	176.11233
North York	5	1094.29863
Scarborough	10	668.22466
Toronto	94	4262.63288
Vaughan	1	69.63562
NA	3	111.35616
Total	**115**	**6382.26027**

Table 2 displays the distribution of shelters across the districts of the city. The difference in the numbers is obvious with central Toronto having the highest number of shelters, which ultimately accommodates the most number of people. The Toronto district within the city is the most populous region. The difference is interesting because the population of North York and Scarborough is much closer to the population of Toronto (*About Toronto Neighbourhoods*, n.d.). Nevertheless, the shelter distribution is nowhere near the actual population, with the district of Toronto surpassing the number of shelters compared to all other districts, even the populous ones.

Table 3: Total number of shelters in the city of Toronto with average daily users - 2022.

District	Shelters	Users
Etobicoke	2	188.00274
North York	6	1543.89589
Scarborough	8	789.04110
Toronto	90	5287.21918
Vaughan	1	69.95616
NA	4	133.43562
Total	**111**	**8011.55068**

Strikingly, according to Table 3, the average number of users per day has increased drastically despite the decrease in the number of facilities, indicating optimized usage of the available space or possible overcrowding of the shelters. Furthermore, the increase in average daily users is more evident in the central region of Toronto, with a slight increase across other districts.

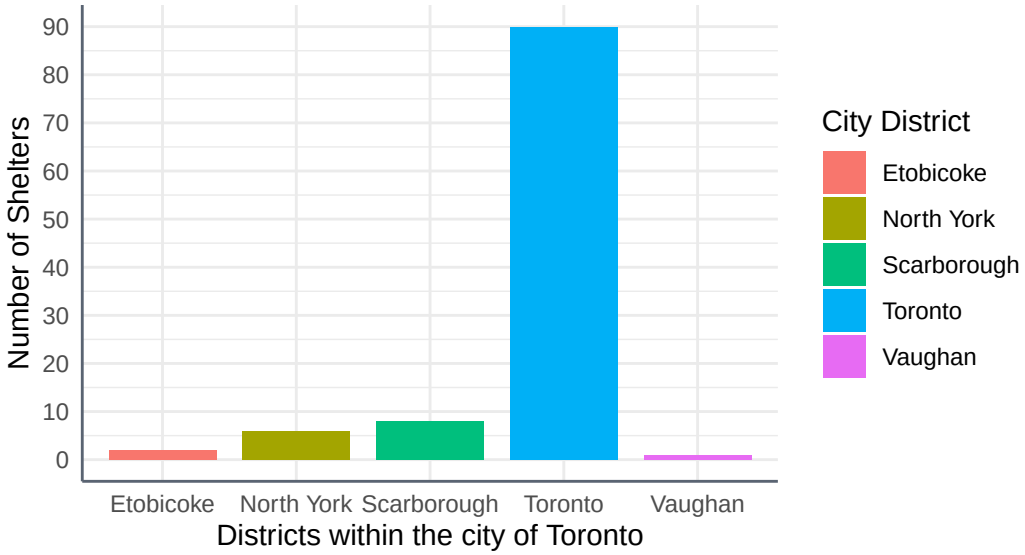

Figure 1: Number of shelters in Toronto by district.

In the above chart (Figure 1), the district of Toronto can be seen as having the highest number of shelters compared to all other regions. The number can be due to the location of the old city in the central region, however, the distribution restricts the number of people looking for shelters to head to the central part of the city. Likewise, the numbers are not proportionate to the population of the city districts. There has been no observable change in the number of shelters from 2021 -2022 based on the data in Table 2 and Table 3.

3.2 The Number of Shelter Users by Program.

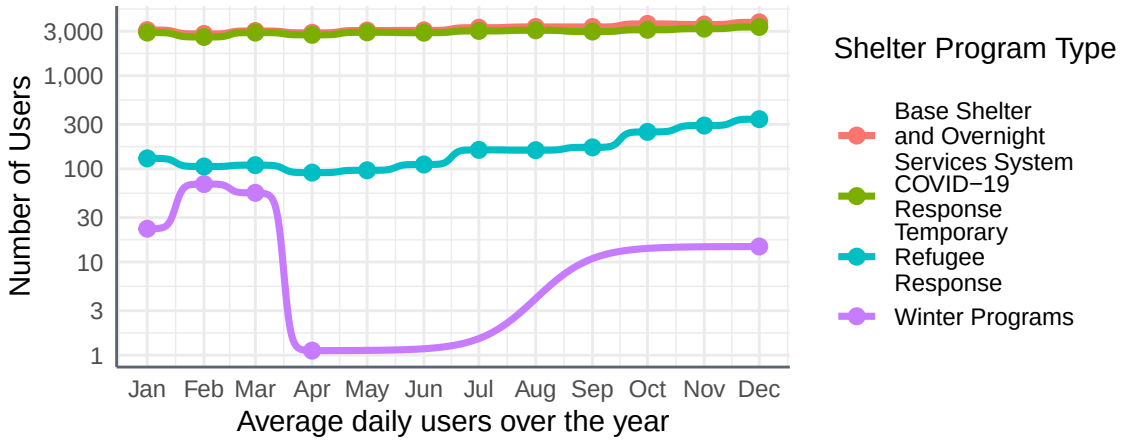

Figure 2: Number of people using shelters by Program - 2021.

The above graph (Figure 2) distinguishes between the various programs of overnight shelters. The base shelter and *Covid-19* programs housed the most people, with a steady growth in the refugee shelter program. The increased number of refugees is also raising the number of people in need of shelter.

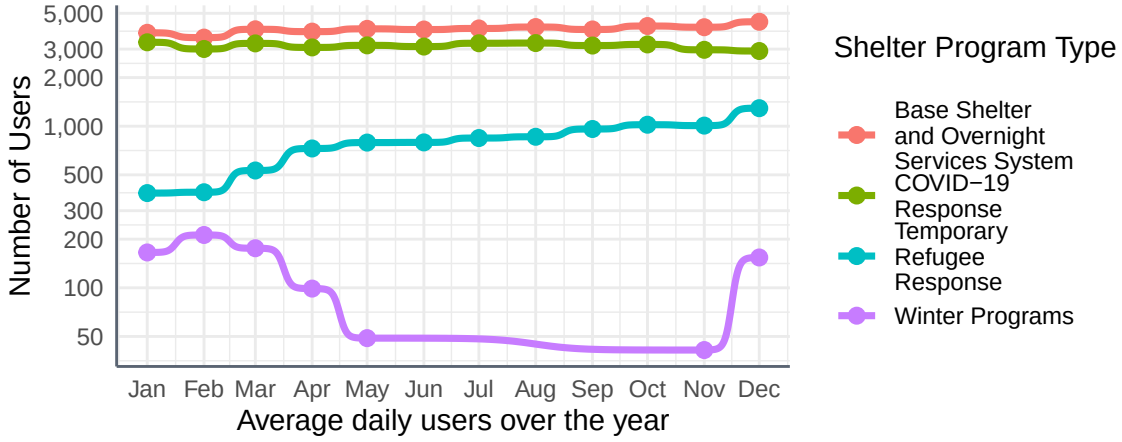

Figure 3: Number of people using shelters over time by Program - 2022.

The number of users has increased, according to Figure 3, with a daily average of 6000 to 8000 people in total. All sector users have increased in number except for *Covid-19* program, which has decreased users compared to last year. The number of refugee program users keeps increasing and has more than doubled compared to the year prior. According to Figure 3, the winter program is most active from December to March with an increased number of people

using the facilities in 2022 compared to the year before.

3.3 The Number of Shelter Users by Sector.

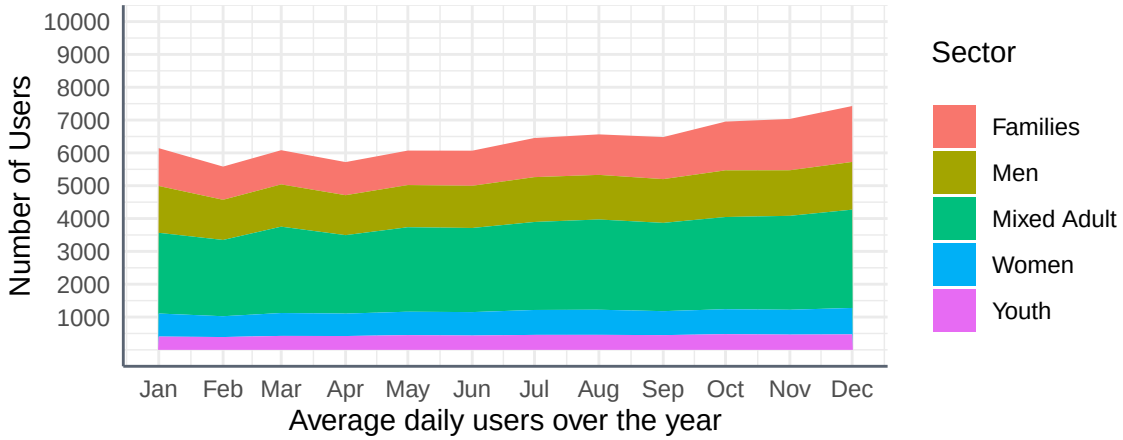

Figure 4: Number of people using shelters over time by Sector - 2021.

Figure 4 indicates that the users based on sectors are predominantly from the Families, Men, or Mixed Adults sectors. Not only are their numbers more compared to other sectors, but they also keep increasing in terms of users throughout the year. The user base has increased almost identically across these three sectors. However, the sectors specific to women and youth have not seen a visible increase in the number of users.

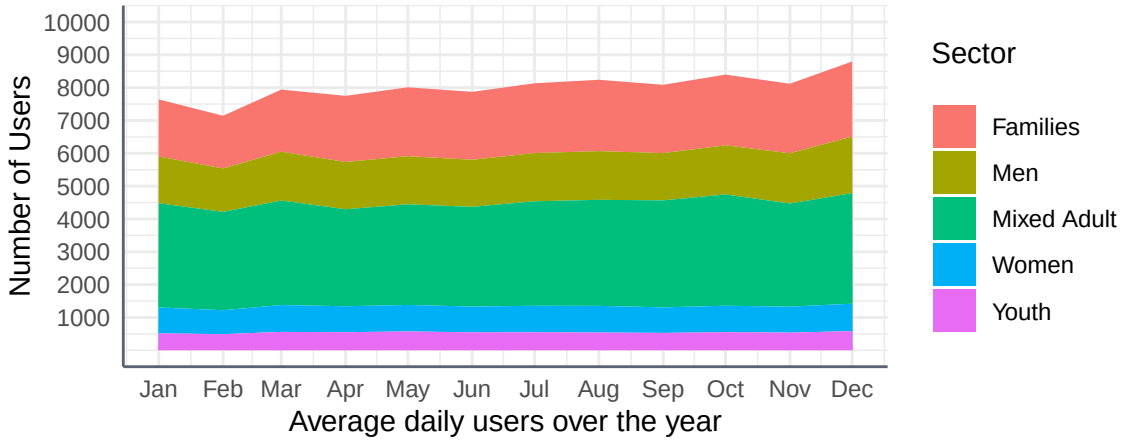

Figure 5: Number of people using shelters over time by Sector - 2022.

Moving from a visible growth in the numbers from the previous year, this year has a similar pattern – showing a rise in the user numbers across the three sectors. Figure 5 demonstrates

an obvious gain of users in the sectors of men, women, and mixed adults compared to the sectors for women and youth, which stay almost similar throughout the year.

4 Discussion

4.1 The Unequal Distribution of Shelters Can Be Problematic.

The shelters are not distributed according to the population of the districts, with the central part of Toronto taking the weight of the most number of shelters. Because of this trend demonstrated in Section 3, the new locations are less likely to increase in other parts of the city. If the city intends to increase the number of shelters, it would be wise to consider the location trend during the planning process. According to (*Housing Indicators, 2021 Census* (2022)), overall housing prices are increasing at a noticeable rate. As the cost of housing increases without the increase in pay, the vacancy rates are likely to increase in the coming years. If the city does not increase the number of shelters across all districts, the housing crisis will force more people to head to the city center. According to Table 2 and Table 3 the number of shelters has decreased in the year 2022 while the population living in the shelters has risen. The city of Toronto has averaged the highest number of daily users – indicating possible overcrowding of the existing facilities.

4.2 The City's Progress in Accommodating More People.

The daily user average has grown in the available shelters demonstrated in Section 3. This can be due to the city's efforts towards improving the existing facilities to house more people while also building new shelters. According to the city government, the city is expanding its existing shelter sites and creating replacements for decommissioned sites (*New Shelter Locations*, n.d.). However, the focus of the city has been *Covid-19* related to shelters throughout the years 2021 and 2022. The physical distancing protocols also pushed the city to develop more facilities and create more space within the existing locations. We also learned that in addition to the base shelters, the city is also accommodating an increasing number of refugees every year by building shelters specific to their needs. Similarly, the winter program has also seen a rise in the number of daily users. The user growth, especially in the refugee and winter programs, indicates a positive increase and care by the city of Toronto. As the city keeps up with the growing needs of people requiring shelters, the chances of people growing individually and moving out of shelters will increase. However, it also depends on other factors like living conditions that the data set does not express. In order to provide better service to the population, the city needs to develop more facilities and improve the living conditions of the existing facilities by increasing funding, care, and living space for the users.

4.3 The Increasing Number of Users in Specific Sectors.

According to Homeless Hub Canada, the female and youth population suffering from homelessness is 34% and 11% respectively (2021). Nevertheless, the number of users has not increased in these specific sectors (Figure 4 and Figure 5). On the contrary, the number of users is growing in the Families, Mixed Adults, and Men sectors. The increase also indicates that women and youth are most likely using these three sectors instead of their gender and age-specific locations. The scale of the major three sectors can also be due to the present need and conditional funding. Nevertheless, the Women and Youth sectors need more shelters and funding to serve their specific audiences.

5 Limitations

5.1 The Case of Increased Users with Limited Shelters, and the Living Conditions.

Earlier in our analysis (3.1, Section 3), we discovered a visible increase in the number of daily users from the year 2021 to 2022 despite the decrease in the number of shelters. The increase in daily users independently depicts a better picture, indicating that the need for increased living space is being met. However, analyzing the decline in the number of shelters with the increase in daily users hints towards overcrowding of the shelters. To better understand the ground reality through data, we also need a measurement representing the living conditions in our data set.

5.2 Empathy with the User

> "The death of one man is a tragedy, the death of millions is a statistic."
>
> — Kurt Tucholsky, a German journalist and writer.

Similar to the living condition issue, the data does not offer an in-depth review of the improvement or lack thereof in the individual lives of people living in these shelters. Do the shelters provide a beneficial refuge that enables people to restart their lives? Do they help people suffering from homelessness and similar problems rehabilitate? For such answers, we need more anecdotal data or measures of satisfaction. We cannot empathize with the users utilizing big data without the individual satisfaction information. Having access to satisfaction data will help us empathize with the users rather than profiling the overall group. It will also enable us to analyze the role of shelters in fulfilling their user needs.

5.3 The Changing Programs and Sectors.

One obstacle in analyzing the unique locations is that the associated programs with these locations can change throughout the year. Hence, a location designed as a *Covid-19* shelter can transform into a base shelter. Similarly, a facility serving under the Families program can change into Mixed Adults and vice versa. Although the change is realistic based on the practical needs of the facilities, it does cause some problems in our analysis as the location variable duplicates many times over the year. The change is also not measurable because the particular locations change independently at a different point than others throughout the year.

6 Appendix

6.1 Code

The report was created using *R* (R Core Team 2020) and *R Studio* (RStudio Team 2020) with *Quarto* (Quarto, n.d.) – a new version of *R Markdown* (RStudio, n.d.). The main library utilized for this purpose is *Tidyverse* (Wickham et al. 2019). Its used sub-packages include *dplyr* (Wickham et al. 2022) to enable query-like syntax, and *ggplot* (Wickham 2016) to create graphs and charts. Other packages and tools include *here* (Müller 2020), *janitor* (Firke 2021), *knitr* (Xie 2022), *kableExtra* (Zhu 2021), and *scales* (Wickham and Seidel 2022). Their respective function is to find *csv* files, clean data, generate reports, create tables, and enable customized legends and break points. Lastly, as *csv* files convert the date column to character, the *lubridate* (Grolemund and Wickham 2011) package was used to convert character dates to proper dates, essential for plotting date and time variables.

References

2021. Homeless Hub Canada. https://www.homelesshub.ca/community-profile/toronto.

About Toronto Neighbourhoods. n.d. City Government. https://www.toronto.ca/city-government/data-research-maps/neighbourhoods-communities/neighbourhood-profiles/about-toronto-neighbourhoods/.

Community Council Area Profiles. n.d. City Government. https://www.toronto.ca/city-government/data-research-maps/neighbourhoods-communities/community-council-area-profiles/.

Firke, Sam. 2021. *Janitor: Simple Tools for Examining and Cleaning Dirty Data*. https://CRAN.R-project.org/package=janitor.

Gelfand, Sharla. 2022. *Opendatatoronto: Access the City of Toronto Open Data Portal*. https://CRAN.R-project.org/package=opendatatoronto.

Glossary: Housing Stability Service System Overview. 2023. City Government. https://www.toronto.ca/city-government/data-research-maps/research-reports/housing-and-homelessness-research-and-reports/housing-stability-service-system-map-and-terms/.

Grolemund, Garrett, and Hadley Wickham. 2011. "Dates and Times Made Easy with lubridate." *Journal of Statistical Software* 40 (3): 1–25. https://www.jstatsoft.org/v40/i03/.

Housing Indicators, 2021 Census. 2022. Statistics Canada. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/dv-vd/housing-logement/index-en.cfm.

Müller, Kirill. 2020. *Here: A Simpler Way to Find Your Files*. https://CRAN.R-project.org/package=here.

New Shelter Locations. n.d. City Government. https://www.toronto.ca/community-people/community-partners/emergency-shelter-operators/about-torontos-shelter-system/new-shelter-locations/.

Quarto. n.d. *Quarto, an Open-Source Scientific and Technical Publishing System Built on Pandoc*. https://quarto.org.

R Core Team. 2020. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

RStudio. n.d. *Your Data Tells a Story. Tell It with r Markdown*. https://rmarkdown.rstudio.com.

RStudio Team. 2020. *RStudio: Integrated Development Environment for r*. Boston, MA: RStudio, PBC. http://www.rstudio.com/.

Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. https://ggplot2.tidyverse.org.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. https://doi.org/10.21105/joss.01686.

Wickham, Hadley, Romain François, Lionel Henry, and Kirill Müller. 2022. *Dplyr: A Grammar of Data Manipulation*. https://CRAN.R-project.org/package=dplyr.

Wickham, Hadley, and Dana Seidel. 2022. *Scales: Scale Functions for Visualization*. https://CRAN.R-project.org/package=scales.

Xie, Yihui. 2022. *Knitr: A General-Purpose Package for Dynamic Report Generation in r*.

https://yihui.org/knitr/.
Zhu, Hao. 2021. *kableExtra: Construct Complex Table with 'Kable' and Pipe Syntax*. https://CRAN.R-project.org/package=kableExtra.