

ACNC Registry data: Arrow version

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This code shows how one can use **list columns** (e.g., in a parquet file) to provide a single-file (or single-table) representation of data that might naturally be stored as multiple tables in a more traditional **relational database**. The code to produce the parquet file used in the following analysis is provided [here](#).

In the original registry data supplied by the ACNC, the data I have stored in list columns were spread over multiple columns. For example, “Operating locations (columns R-Z)” included columns such as “Operates in ACT” and “Operates in VIC” with values equal to either Y or blank. I converted these columns to a single column, `states`, with values such as VIC or VIC, NSW. While these look like simply comma-separated text values when viewing the data in software such as [Tad](#), they are actually list columns.

Other list columns include `operating_countries` (originally a single column, but as comma-separated text, not a list column), `subtypes` (originally “Subtypes (columns AA-AN)”), and `beneficiaries` (originally “Beneficiaries (columns AO-BN)”). Below I provide examples of working with such columns.

In writing this note, I use the packages listed below.¹ This note was written using [Quarto](#) and compiled with [RStudio](#), an integrated development environment (IDE) for working with R. The source code for this note is available [here](#) and the latest version of this PDF is [here](#).

```
library(tidyverse)
library(tinytable)
library(arrow)
library(farr)
```

We start by downloading the data, which takes a few seconds.

¹Execute `install.packages(c("tidyverse", "arrow", "tinytable", "farr"))` within R to install all the packages you need to run the code in this note.

```
registry <-
  read_parquet('https://go.unimelb.edu.au/5d78') |>
  collect() |>
  system_time()
```

```
      user  system elapsed
0.425    0.076    3.220
```

We can construct the beneficiaries data frame by using `unnest()` with the list column `beneficiaries`.

```
beneficiaries <-
  registry |>
  select(abn, beneficiaries) |>
  unnest(beneficiaries) |>
  rename(beneficiary = beneficiaries)
```

Charities vary in terms of the groups they serve, or **beneficiaries**. The results of the following code are shown in Table 1.

```
registry |>
  unnest(beneficiaries) |>
  count(beneficiaries, sort = TRUE) |>
  tt() |>
  style_tt(aligned = "ld") |>
  format_tt(escape = TRUE)
```

Many charities serve multiple beneficiary types. The most common pairs of beneficiary types are given in Table 2, which is produced using the following code.

```
beneficiaries |>
  inner_join(beneficiaries, by = "abn",
            relationship = "many-to-many") |>
  filter(beneficiary.x < beneficiary.y) |>
  count(beneficiary.x, beneficiary.y) |>
  arrange(desc(n)) |>
  head(n = 10) |>
  tt() |>
  style_tt(aligned = "lld") |>
  format_tt(escape = TRUE)
```

Table 1: Number of charities serving each beneficiary type

| beneficiaries | n |
|-------------------------------------|--------|
| Youth | 24,633 |
| Adults | 23,992 |
| Families | 23,188 |
| General Community in Australia | 22,638 |
| Children | 22,130 |
| Aged Persons | 21,763 |
| Females | 19,027 |
| Males | 18,012 |
| Financially Disadvantaged | 15,826 |
| Early Childhood | 15,184 |
| Rural Regional Remote Communities | 14,757 |
| Ethnic Groups | 14,384 |
| Aboriginal or TSI | 13,528 |
| People with Disabilities | 13,396 |
| People at risk of homelessness | 9,493 |
| Unemployed Person | 9,327 |
| People with Chronic Illness | 8,082 |
| Other Charities | 6,513 |
| Veterans or their families | 5,656 |
| Victims of crime | 5,220 |
| Victims of Disasters | 4,856 |
| Communities Overseas | 4,710 |
| Migrants Refugees or Asylum Seekers | 3,735 |
| Pre Post Release Offenders | 3,612 |
| Gay Lesbian Bisexual | 2,890 |

Table 2: Most common beneficiary pairs

| beneficiary.x | beneficiary.y | n |
|---------------|---------------|--------|
| Adults | Aged Persons | 19,277 |
| Adults | Youth | 18,429 |
| Children | Youth | 17,384 |
| Females | Males | 17,182 |
| Adults | Families | 16,247 |
| Aged Persons | Youth | 15,787 |
| Families | Youth | 15,381 |
| Aged Persons | Families | 15,048 |
| Adults | Females | 14,088 |
| Children | Families | 13,987 |

The results of the following code are shown in Table 3.

```
registry |>
  unnest(operating_countries) |>
  select(abn, operating_countries) |>
  filter(operating_countries != "AUS") |>
  count(operating_countries, sort = TRUE) |>
  head(n = 10) |>
  tt() |>
  format_tt(escape = TRUE)
```

The results of the following code are shown in Table 4.

```
registry |>
  unnest(operating_countries) |>
  distinct(abn, operating_countries) |>
  filter(operating_countries != "AUS") |>
  count(abn, name = "num_countries", sort = TRUE) |>
  mutate(num_countries = if_else(num_countries > 10, "More than 10",
                                as.character(num_countries)),
         num_countries = fct_inorder(num_countries)) |>
  count(num_countries) |>
  arrange(desc(num_countries)) |>
  tt() |>
  style_tt(align = "ld") |>
  format_tt(escape = TRUE)
```

Table 3: Most common countries of operation

| operating_countries | n |
|---------------------|-----|
| IDN | 430 |
| PHL | 385 |
| PNG | 371 |
| KEN | 360 |
| UGA | 299 |
| NPL | 270 |
| FJI | 263 |
| IND | 247 |
| THA | 241 |
| VNM | 240 |

The results of the following code are shown in Table 5.

```
registry |>
  unnest(subtypes) |>
  count(subtypes, sort = TRUE) |>
  head(n = 10) |>
  tt() |>
  style_tt(aligned = "ld") |>
  format_tt(escape = TRUE)
```

Table 4: Number of countries of operation per charity

| num_countries | n |
|---------------|-------|
| 1 | 1,711 |
| 2 | 455 |
| 3 | 237 |
| 4 | 137 |
| 5 | 112 |
| 6 | 79 |
| 7 | 56 |
| 8 | 42 |
| 9 | 35 |
| 10 | 29 |
| More than 10 | 187 |

Table 5: Most common charity subtypes

| subtypes | n |
|--|--------|
| Advancing Religion | 16,954 |
| Advancing social or public welfare | 12,624 |
| Advancing Education | 11,887 |
| PBI | 11,696 |
| Purposes beneficial to ther general public and other analogous | 6,674 |
| Advancing Health | 6,305 |
| Advancing Culture | 5,121 |
| HPC | 2,463 |
| Advancing natual environment | 2,153 |
| Promoting reconciliation mutual respect and tolerance | 1,440 |