

Queensland Dental Waiting List — Database Design

Overview

The Queensland Dental Waiting List data tracks patient movement in and out of waiting and treated status across participating clinics in different regions.

This step of the project designs a **relational database** that supports analysis of:

- Patient wait times
- Clinic performance
- Trends over multiple years

Data Sources

- Data is provided in multiple XLSX files, organized by financial year and quarter.
- Each file contains:
 - Date / quarter
 - Appointment type or service “area”
 - Number of patients waiting and treated
 - Participating clinics and serviceable regions

Source Description (Open Data Portal)

Oral health data is collected from Queensland Health dental clinics.

It details:

- Number of adult dental appointments
- Number waiting for assessment
- Length of wait time by priority

Some services use a standardized questionnaire to assign patients to a priority category.

Data is updated monthly and considered preliminary.

“—” indicates unavailable data.

Flat File Example

date	clinicID	clinicName	Hospital and Health Service	Area	Waiting D1	Waiting D2	Waiting D3	Waiting D4	Waiting D5	Waiting D6	Waiting D7	Treated D1	Treated D2
30/06/2024	1	KAWANA DENTAL CLINIC	Sunshine Coast	Clinical Assessment	0	0	0	0	0	0	0	-	43
30/06/2024	1	KAWANA DENTAL CLINIC	Sunshine Coast	General	1,646	1,514	1	0	0	0	0	100	1
30/06/2024	1	KAWANA DENTAL CLINIC	Sunshine Coast	Priority 1	0	0	0	0	0	0	0	-	2
30/06/2024	1	KAWANA DENTAL CLINIC	Sunshine Coast	Priority 2	48	63	40	37	29	2	22	9	21

Distinct Appointment Areas

Appointment Type	Description
Clinical Assessment	Determines treatment priority; desirable within 1 month
General	Routine check-ups and treatment; desirable within 24 months
Priority 1	Treatment desirable within 1 month
Priority 2	Treatment desirable within 3 months
Priority 3	Treatment desirable within 12 months
General Anaesthetic Category 1	Under GA, desirable within 1 month
General Anaesthetic Category 2	Under GA, desirable within 3 months

Appointment Type	Description						
General Anaesthetic Category 3	Under GA, desirable within 12 months						

Waiting Time Ranges (Months)

Wait List	D1	D2	D3	D4	D5	D6	D7
Clinical Assessment	< 1	1–2	2–3	3–4	4–5	> 5	^
General	< 12	12–24	24–36	36–48	48–60	> 60	^
Priority 1	< 1	1–2	2–3	3–4	4–5	> 5	^
Priority 2	< 3	4–6	7–9	10–12	13–15	> 15	^
Priority 3	< 6	7–12	13–18	19–24	25–30	> 30	^
GA Category 1	< 1	1–2	2–3	3–4	4–5	> 5	^
GA Category 2	< 3	4–6	7–9	10–12	13–15	> 15	^
GA Category 3	< 6	7–12	13–18	19–24	25–30	> 30	^

^ = % within recommended waiting time

Database & Data Modelling

Guided by:

Information Modeling and Relational Databases (2nd Ed.) — Terry Halpin & Tony Morgan

Universe of Discourse

Queensland Dental Waitlist System

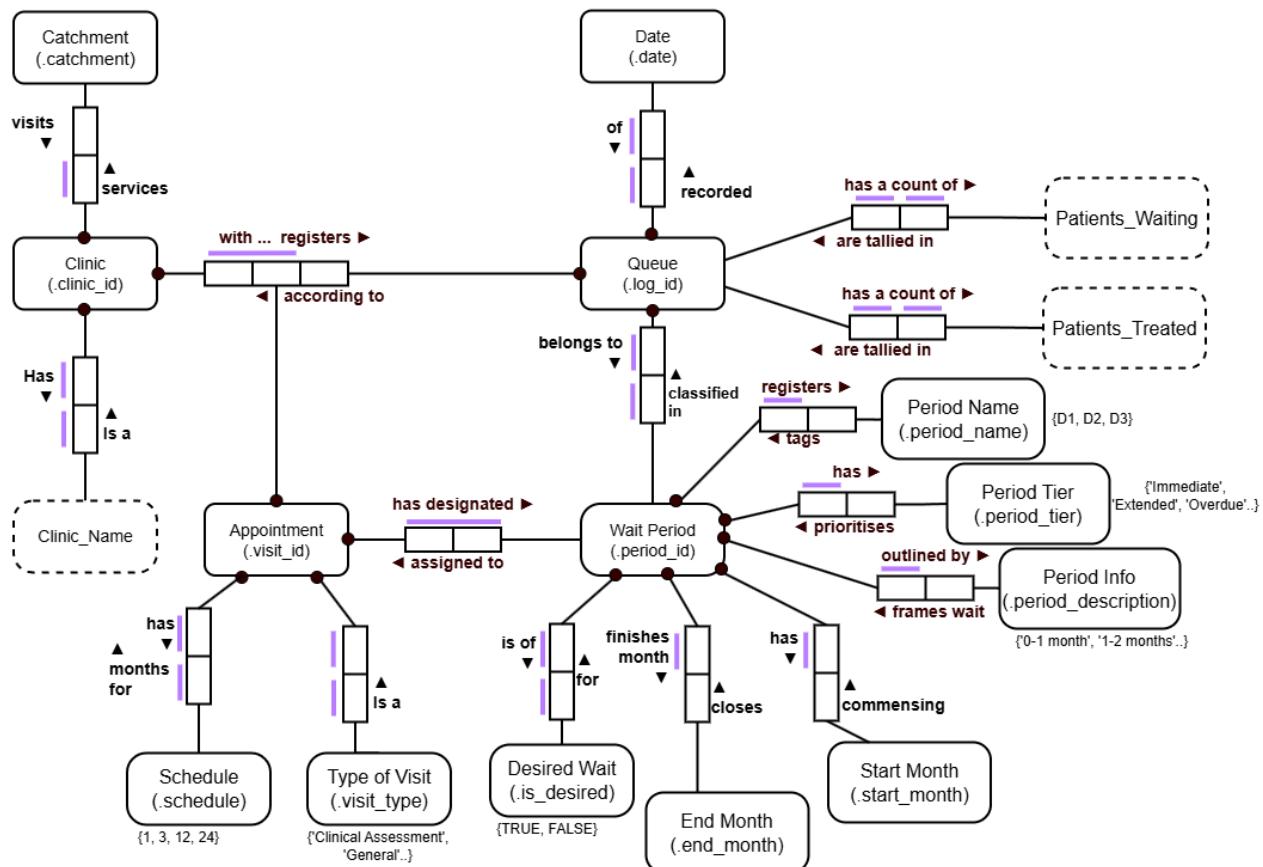
Identified Entities

Entity	Description
Clinic	Participating clinic (clinic name, ID, catchment)
Appointment	Appointment type (description, wait period)
Catchment	Geographic service area
Wait_Period	Ranges of wait time by appointment type
Queue	Records patients waiting/treated for a clinic-period
Date	Quarterly reporting date

Identified Relationships

#	Elementary Fact	Example	Uniqueness
1	Clinic <i>offers</i> Appointment	Kippa-Ring Central Clinic offers General appointments	1:n
2	Queue <i>includes</i> Patients_Waiting	Queue_Log D1 has 120 patients waiting	1:1
3	Queue <i>includes</i> Patients_Treated	Queue_Log D1 has 10 patients treated	1:1
4	Clinic <i>with</i> Appointment <i>has</i> Queue	Kippa-Ring Clinic's General Appointment has Queue_Log	n:m
5	Clinic <i>services</i> Catchment	Each Clinic has a catchment area	n:1
6	Appointment <i>has</i> Wait Period	Each Appointment defines wait period criteria	1:n
7	Appointment <i>outlined by</i> Description	Appointment type is described by text	1:1
8	Queue <i>records</i> Date	Each Queue log is time-stamped by date	1:1
9	Clinic_ID <i>represents</i> Clinic Name	Clinic_ID '023' belongs to Kippa-Ring Central	1:1

ORM Schema — Queensland Dental Waitlist System



Relational Schema Mapping

Legend:

{ **primary key**, **foreign key**, **candidate key**, **nullable field** }

Table	Fields
clinic	{ clinic_id , clinic_name , catchment }
appointment	{ visit_id , visit_type , schedule }
wait_period	{ period_id , period_name , period_tier , period_description , start_month , end_month , is_desired }
appointment_waitperiod	{ visit_id , period_id }
queue	{ log_id , date , period_id , clinic_id , patients_waiting , patients_treated }

Implementation Steps

1. Convert .xlsx files to .csv using Python
2. Combine CSVs into a master dataset
3. Design ORM and normalized relational tables
 - o Use explicit, consistent naming (`snake_case`)
 - o Convert data from wide >> long format
4. Create database in PostgreSQL
5. Create tables: `clinic`, `appointment`, `appointment_waitperiod`, `wait_period`, `queue`
6. Create a temporary table `stage_raw` for master data import
7. Insert distinct ID values from staging into relational tables
8. Update relational tables with correct key references
9. Manually fill `appointment` and `wait_period` tables per Queensland Health documentation
10. Populate junction table `appointment_waitperiod` (linking appointments and wait periods)
11. Normalize queue data from wide >> long using CTE with row grouping (tiers + periods)
12. Insert combined data into `queue` with mapped foreign keys

References

- Queensland Health Performance – Oral Health Care

- AIHW: Oral Health and Dental Care in Australia
- AIHW: Dental & Oral Health Data Sources
- ABC News: QLD Fluoride & Tooth Decay Study
- MJA: Socio-Economic Status & Fluoridated Water Access