

Mobilizing private dental capacity toward equitable access: a national survey of supply-side conditions for public–private partnership in Thailand

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Abstract

Background.

Thailand achieved universal health coverage in 2002, yet dental utilization remains low and socially patterned, and the private sector that holds most clinical capacity is only weakly engaged in publicly contracted care. No low- or middle-income country has nationally characterized the supply-side conditions under which private dental clinics would join a public–private partnership (PPP) for basic care.

Methods.

We conducted a national cross-sectional telephone survey of private dental clinics in Thailand between November 2019 and April 2020. From a registry of 4,681 clinics, 4,666 across the 13 National Health Security Office regions formed the eligible frame; 396 were drawn by proportional stratified sampling, yielding 196 interviews (49.5% response). The instrument captured clinic structure, spare capacity, decision drivers, and prices for 13 routine services. We applied descriptive statistics, paired Wilcoxon tests with Holm correction, and binary and multinomial logistic regression, following STROBE.

Results.

Of 176 respondents answering the intent item, 59 (33.5%) were interested, 79 (44.9%) uncertain and 38 (21.6%) not interested, leaving 138 (78.4%) willing or potentially willing. Spare capacity was the strongest correlate: clinics already at capacity had 88% lower adjusted odds of joining (adjusted odds ratio 0.12, 95% confidence interval 0.05–0.32, $p < 0.001$), surviving adjustment for demographics, region and drivers. Civil-service experience did not independently predict joining. Administrative-burden sensitivity distinguished the uncertain, persuadable group from committed joiners, whereas community-service motivation marked the committed and public-image concern the not-interested. Current prices exceeded dentists' acceptable price for 12 of 13 services, and acceptance of the proposed fee schedule varied 65 percentage points across services — from 9.5% for fluoride application, where the proposed 100 baht (international dollars [int\$] 8) sat well below the expected 300 baht (int\$25), to 74.5% for a dental x-ray, where the proposed fee matched the expected price exactly.

Conclusions.

A latent pool of private clinics is ready to deliver publicly contracted basic care, though stated willingness overstates uptake.

Background

The World Health Organization's Global Oral Health Action Plan 2023–2030 frames oral disease as a major and unequally distributed burden, with the largest impact on populations with restricted access to basic care, and sets a framework to close that gap [1]. Thailand shows the pattern clearly. The 9th National Oral Health Survey recorded a high caries burden across the life-course: dental-caries prevalence reached 47.0% in three-year-olds, 72.1% in five-year-olds, 49.7% in twelve-year-olds and 61.2% in fifteen-year-olds; 52.9% of adults aged 35–44 years had untreated caries and 32.6% had deep periodontal pockets; and 60.0% of older adults aged 60–74 years had untreated coronal caries [2]. These figures span early childhood through older adulthood, indicating a population-wide problem rather than a paediatric or geriatric one.

Universal health coverage policies have not, on their own, closed dental utilization inequities in low- and middle-income country (LMIC) settings. Thailand's Universal Coverage Scheme (UCS) has operated since 2002 and is one of the most-studied LMIC universal-coverage programmes [3]. Two national data series converge on the same conclusion. The 2017 Health and Welfare Survey found that 9.6% received any dental service in the preceding 12 months, 81.6% of these treatment rather than preventive [4]. Utilization varied steeply by scheme (Civil Servant Medical Benefit Scheme 14.8%, Social Security Scheme 12.3%, UCS 8.5%, no scheme 2.8%) and by wealth quintile (highest 15.7% vs lowest 7.0%) [4]. Serial analysis of four National Oral Health Surveys recorded the same gradient: adult utilization rose from 31.0% to 42.0% between 2000 and 2017, while education- and income-related inequalities persisted [5]. The two series are not directly comparable in level but both show that UCS raised utilization without narrowing its socioeconomic slope. The COVID-era 2021 and post-COVID 2023 HWS waves extend this longitudinal series [6, 7]. Universal coverage moves the access curve upward but leaves its slope intact, a pattern that motivates the public–private partnership response examined below.

The pattern is not a problem of national workforce supply. In both high-income country (HIC) and LMIC settings, the private sector holds the majority of clinical capacity and is geographically uncoupled from public-sector shortfalls [8]. In Thailand, around half of dentists practised in the private sector in the early 2000s, mostly in urban municipalities [9], with roughly one dentist per 6,681 population by 2017 [10]. The national-registry snapshot at our fieldwork recorded 4,681 registered private dental clinics across Thailand (7 September 2017), more than a third concentrated in Bangkok alone [11]. A similar mismatch is documented in New South Wales, Australia, where 80–90% of dental services are delivered privately yet 12% of the most disadvantaged rural residents live more than 50 km from the nearest public dental practice [12]. Engaging private providers within publicly financed care is therefore a structural lever rather than a marginal supplement.

Public–private partnership (PPP) mobilizes private provider capacity within publicly financed care, although evidence on long-term cost, risk-transfer, and equity effects is mixed [13, 14, 15]. We use the term in the service-contracting sense, that is, purchaser contracting with existing private clinics for publicly financed care, rather than the infrastructure-finance model addressed by much of the critical PPP literature [15]. In dental services, high- and middle-income countries have used contracting, fee-for-service reimbursement, and gate-keeping to integrate private providers into national systems, with

documented variation in access, quality, and cost-containment outcomes [16, 13, 17, 18]. A recent realist review of dentists' participation in state-funded primary dental care identified restrictive contracts, ceded clinical control, and mistrust of the purchasing system as key mechanisms of disengagement, operating alongside funding constraints rather than through fee levels alone [19]. Thailand has accumulated more than fifteen years of provincial dental PPP experience under a single universal-coverage umbrella, with at least six provinces operating schemes from the mid-2000s onward; these shared a contracting-out logic and per-procedure fee-for-service payment at tariffs below private list price, while differing in operational pathway, gate-keeping, and budgetary discipline [20]. At national level, contracting of private providers under the Universal Coverage Scheme has been characterized for general health services [21], but not for dentistry. Early evaluation in Nakhon Ratchasima documented utilization gains of 18% to 144% across three contracting units in the first year of operation [22]. Whether and how this provincial experience can be mobilized at national scale depends first on the readiness of the private sector to participate, which has not been characterized at population level.

This is the gap we address. To our knowledge, no low- or middle-income country has nationally characterized the supply-side readiness of private dental clinics for participation in publicly financed dental PPP – their willingness to participate, spare clinical capacity, operational availability, and reimbursement expectations. Without such evidence, scale-up rests on ad hoc assumptions about which clinics will engage and on what terms.

We address this gap through a national cross-sectional survey of private dental clinics focused on supply-side readiness, fielded before both the COVID-19 pandemic and the 2024 national rollout of private-sector dental contracting, and therefore read throughout as a pre-rollout baseline. We adopt the patient-centred access framework of Levesque et al. [23] as the primary lens, complemented by a principal-agent perspective on public-purchaser-private-provider contracting [14]; the market-failure framing of dental services [16] and scoping-review evidence on payment-mechanism trade-offs [24] inform our interpretation. Within this frame, we ask two questions:

1. What is the national supply-side readiness for dental PPP among Thai private dental clinics, in terms of willingness to participate, spare capacity, operational availability, and acceptable reimbursement?
2. How do these findings inform reimbursement and recruitment design for dental PPP in Universal Coverage settings, with implications for other health systems, particularly middle-income ones, scaling private-provider dental contracting?

Methods

Study design

We conducted a national cross-sectional telephone survey of private dental clinics in Thailand between November 2019 and April 2020 to characterize supply-side capacity and conditions for participation in public-private dental partnerships under the Universal Coverage Scheme. Reporting follows the

Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies [25, 26]; the completed checklist is provided with the submission.

Sampling frame and procedure

The sampling frame was the national registry of private dental clinics maintained by the Bureau of Sanatorium and Art of Healing, Department of Health Service Support, Ministry of Public Health (snapshot 7 September 2017). The registry contained **4,681** unique private dental clinics nationally; after region-level cleaning to harmonize health-region assignments, **4,666 clinics** formed the eligible frame across the 13 National Health Security Office (NHSO) health regions.

For a finite population of 4,666 eligible clinics, a binary outcome proportion of 0.5, 95% confidence, and 5% margin of error, the finite-population formula yielded a minimum sample of 355 clinics. Allowing for non-response, this was rounded up to a working target of 400, and we drew a proportional stratified sample of **396 clinics** across the 13 regions. A working call list of 592 entries was contacted, including same-stratum replacements. The realized analytic sample comprised **196 respondents**, a response rate of 49.5% relative to the 396 drawn clinics and 33.1% relative to the 592 contacts attempted (including same-stratum replacements; AAPOR RR2). The single-respondent yield in Health Region 5 (below) leaves the Central macro-region vulnerable to non-response bias; we assess the leverage of the affected regions in sensitivity analyses and revisit this in the Limitations.

Two sampling-design deviations are disclosed. Health Region 5 (Western Central) yielded 1 respondent against a drawn target of 26 (4% response), raising potential non-response bias in the Central macro-region; Health Region 11 (Upper South) yielded 26 against a target of 21 (124%), reflecting replacement contacts used to compensate for non-response in adjacent regions. Both deviations are addressed in the sensitivity analyses; their interpretive limits are discussed in the Limitations.

Data collection and instrument

Trained interviewers administered the structured telephone questionnaire, recording responses directly into REDCap (project 224); the full instrument is provided as Additional file 1. The instrument covered five domains: (i) clinic structure (chairs [dental units], staff, ownership); (ii) operating hours by day and time block; (iii) current and acceptable rates for 13 common dental procedures; (iv) PPP willingness and the conditions influencing it; and (v) clinic-owner background (age, sex, current and prior civil-service status). Implausible values and REDCap sentinel codes in the age, patient-volume and price fields were recoded as missing before analysis; the current-price item for simple extraction was added to the instrument partway through fieldwork and was captured for 45 interviews.

Variables

The intent-to-join item recorded three responses: interested, uncertain, and not interested; respondents who gave no answer were excluded. The primary binary outcome combined interested and uncertain responses (“willing or potentially willing”) versus not interested. To distinguish the uncertain group, we additionally modelled the three-level outcome directly (see Statistical analysis). Candidate predictors comprised clinic capacity (at-capacity vs accepting new patients), civil-service experience (coded as never civil servant [reference], past civil servant only, or currently civil servant), respondent sex, clinic ownership (owner vs non-owner), age (modelled both continuously and in five categories: <30, 30–39, 40–49, 50–59, ≥ 60), five macro-regions (Bangkok, Central, South, Northeast, North), and seven driver ratings. The seven drivers were fee schedule, payment speed, administrative burden, scope of services, community-service motivation, audit and oversight, and professional image. For descriptive summaries each was dichotomized as “high impact” versus other; in regression models the original three-point scale (1–3) was entered as continuous. For each of the 13 services, respondents rated the proposed fee as acceptable, too high, too low, or “don’t know”; all respondents giving a substantive rating, including those rating the fee acceptable, were then asked the price they would consider acceptable for participation under the scheme.

Sample-size justification

The sample-size justification is design-based for descriptive prevalence estimation, as detailed above. With 196 respondents, proportions are estimated with margin of error of $\leq 7.0\%$ at 95% confidence, under a simple-random-sampling approximation that does not incorporate design effects from differential regional response. Multivariable regression models are presented as exploratory characterizations of the supply-side structure, interpreted by effect size and 95% confidence interval rather than by significance threshold alone.

Statistical analysis

Categorical variables were summarized as frequencies and proportions, continuous variables as means with standard deviations (SD) or, where skewed, medians with interquartile ranges (IQR), overall and by macro-region; driver ratings were summarized as the proportion rating each driver “high impact”. Bivariate associations with join intent were tested with χ^2 or Fisher’s exact tests and Mann–Whitney U tests; these p-values are unadjusted and served as a descriptive screen for the prespecified multivariable models, with the Holm correction reserved for the 13 confirmatory price comparisons. We then fitted a multivariable logistic regression for the binary outcome, entering structural predictors in a single block (Model 1, Table 4); a second model added the seven driver ratings (Model 2, Table 5) to separate operational from value-laden drivers. Predictor selection followed the Levesque patient-centred access framework [23] and the principal–agent perspective on public-purchaser contracting [14]. Both models report adjusted odds ratios (aOR) with 95% confidence intervals (CI), two-sided p-values, and McFadden pseudo- R^2 . We additionally fitted an exploratory three-category multinomial logistic regression (baseline = interested) using Firth-type penalized estimation to address separation in the North region, which had

no interested respondents (Table 6). Because the capacity predictor is a self-report that could overlap conceptually with the outcome, four robustness checks are reported in Additional file 2 (Table S2): objective capacity proxies (chair count, patient throughput, days open) substituted for the self-report; a parsimonious model with more events per variable; variance-inflation diagnostics for the driver ratings; and a refit entering the driver ratings as dichotomized rather than continuous.

For each of 13 procedures, the within-respondent difference between the clinic's current charge and the dentist's stated acceptable price was tested with paired Wilcoxon signed-rank tests (asymptotic, tie-corrected variance, zero differences excluded), and the 13 p-values were Holm–Bonferroni adjusted. The proposed PPP fees, drawn from the Bangkok scheme's published tariffs, are presented alongside dentists' acceptable prices in Table 7, with per-service acceptance in Table 8. Because fieldwork predates the COVID-19 pandemic, we treat 2019 nominal prices as the primary values: the pandemic altered dental cost-of-delivery through infection prevention and operatory turnaround in ways a general price index cannot capture. As an illustrative adjustment only, we also express prices in 2026 baht using the Thai headline consumer price index (cumulative factor 1.09 over 2019 to mid-2026) [27], and caution against reading these as current dental costs. For international comparison, the 2019 nominal prices, rather than the CPI-adjusted column, are converted into international dollars (int\$) at the World Bank purchasing-power-parity conversion factor for Thailand for 2019, 11.83 baht per int\$ [28]. A parity factor rather than the market exchange rate (32.7 baht per US dollar in May 2026 [29]) is used because the question at issue is what a fee is worth against Thai input costs.

To address the sampling-design deviations, the primary logistic model was re-fitted on three analytic samples: full (n = 173), excluding Region 5 (n = 172), and excluding Regions 5 and 11 (n = 147), with coefficients reported in Additional file 2: Table S1.

Analyses were performed in R 4.6.0 (R Foundation for Statistical Computing, Vienna, Austria), with the `nnet` and `brglm2` packages for the penalised multinomial model; the robustness checks in Additional file 2 (Table S2) were computed in Python (`statsmodels`).

Use of generative artificial intelligence

We used a generative artificial-intelligence assistant (Claude, Anthropic) to assist with manuscript preparation, generation of analysis code and production of Fig. 1 from the study data using plotting code reviewed by the authors. No AI-generated imagery was used and the assistant was not involved in data collection. All AI-assisted code and outputs were reviewed and validated by the authors, who directed and interpreted the analyses, resolved every reference against its primary record, and take full responsibility for the accuracy and integrity of the manuscript.

Ethics

The study protocol was approved by the Committee of Research Ethics, Faculty of Public Health, Chiang Mai University (Document No. ET008/2018).

Results

Sampling and response

Of **4,681** unique private dental clinics on the national registry (snapshot 7 September 2017), **4,666** were assignable to one of the 13 NHSO health regions after region-level cleaning and formed the eligible frame (Fig. 1). A proportional stratified sample of 396 clinics was drawn across the 13 regions (working call list 592 entries including same-stratum replacements). Structured telephone interviews were completed with 196 dentists between November 2019 and April 2020, an overall response rate of 49.5% relative to the drawn sample. Of these, 182 records were marked complete in REDCap, 1 was unverified, and 13 had partial responses; all 196 are retained in the analytic dataset, with per-cell denominators reflecting partial completion in subsequent tables. The realized sample under-covered Health Region 5 (Western Central; 1 respondent against a drawn target of 26, 4%) and over-covered Health Region 11 (Upper South; 26 respondents against a drawn target of 21, 124%) through the field team's use of replacement contacts.

Characteristics of surveyed clinics

The 196 responding clinics were distributed as 51 in Bangkok, 47 in the Central macro-region, 46 in the South, 31 in the Northeast, and 18 in the North; three respondents were missing region assignment and appear only in the overall totals (Table 1). Of 196 dentists, 108 (55.1%) were female and mean age was 44.5 years (SD 11.3, $n = 195$ after recoding one implausible value of 4 to missing). One hundred and seventy-nine respondents (91.3%) identified as clinic owners; 56 (28.6%) were currently employed in any government or state-enterprise position while practising privately, and 153 (78.1%) reported ever having held such a position. Median years of civil service was 1 (IQR 0–1), reflecting a mode of brief post-graduate government service followed by transition to private practice.

Table 1
Characteristics of surveyed private dental clinics and responding dentists, overall and by macro-region
(n = 196)

Characteristic	Overall(n = 196)	Bangkok(n = 51)	Central(n = 47)	South(n = 46)	Northeast(n = 31)	North(n = 18)
Dentist sex — n female (%)	108 (55.1%)	21 (41.2%)	32 (68.1%)	26 (56.5%)	16 (51.6%)	11 (61.1%)
Dentist age, mean $\pm$ SD (yr)	44.5 $\pm$ 11.3	50.4 $\pm$ 13.0	40.2 $\pm$ 9.4	42.9 $\pm$ 10.7	41.6 $\pm$ 9.6	46.4 $\pm$ 8.6
Currently civil servant — n (%)	56 (28.6%)	9 (17.6%)	7 (14.9%)	16 (34.8%)	16 (51.6%)	8 (44.4%)
Ever civil servant — n (%)	153 (78.1%)	32 (62.7%)	35 (74.5%)	42 (91.3%)	28 (90.3%)	15 (83.3%)
Years civil service, median (IQR)	1 (0–1)	0 (0–9)	0 (0–5)	0 (0–1)	1 (0–1)	1 (0–1)
Clinic-owner role — n (%)	179 (91.3%)	48 (94.1%)	39 (83.0%)	44 (95.7%)	29 (93.5%)	16 (88.9%)
Number of dental units, median (IQR)	2 (2–3)	2 (2–4)	2 (2–3)	2 (2–3)	2 (2–3)	2 (2–2)
At capacity (vs accepting new basic-care patients) — n (%)	44 (22.8%)	11 (22.0%)	11 (23.9%)	9 (20.0%)	8 (25.8%)	4 (22.2%)
Days open per week, median (IQR)	7 (6–7)	7 (6–7)	7 (6–7)	7 (6–7)	7 (7–7)	7 (6–7)
Open weekend — n (%)	194 (99.0%)	50 (98.0%)	47 (100.0%)	45 (97.8%)	31 (100.0%)	18 (100.0%)
Open evening — n (%)	179 (91.3%)	47 (92.2%)	47 (100.0%)	37 (80.4%)	28 (90.3%)	17 (94.4%)
Patients/weekday, median (IQR)	10 (5–15)	10 (8–15)	10 (6–15)	7 (5–10)	10 (5–15)	8 (5–15)
Patients/weekend-day, median (IQR)	12 (10–20)	10 (8–20)	18 (10–25)	10 (8–16)	20 (10–20)	11 (8–20)
Joined PPP intent — n yes/n responded (%)	138 (78.4%)	33 (70.2%)	34 (75.6%)	41 (91.1%)	26 (83.9%)	3 (50.0%)

Values are n (%), mean $\pm$ SD, or median (IQR). 'Civil servant' = current or past employment in any government or state-enterprise body. 'Open evening' = any operating slot 17:00–20:00; 'open weekend' = any Saturday or Sunday slot. 'At capacity' = no longer accepting new basic-care patients (193 answered; 3 missing); among the 176 intent respondents (Tables 3–6), 42 (23.9%) were at capacity. 'Joined PPP intent' combines

‘interested’ and ‘uncertain’; 20 non-responses are excluded from the denominator. Macro-regions: Bangkok = HA 13; Central = HA 4–6; South = HA 11–12; Northeast = HA 7–10; North = HA 1–3; three respondents missing region appear in Overall only.

Clinics operated extensively outside conventional weekday hours. Median days open per week was 7 (IQR 6–7); 194 of 196 (99.0%) opened on at least one weekend day, and 179 (91.3%) operated at least one evening slot between 17:00 and 20:00. Median throughput was 10 patients per weekday (IQR 5–15) and 12 per weekend day (IQR 10–20). Median chair count was 2 (IQR 2–3). These figures indicate a supply side that is structurally available during the after-work and weekend periods in which Universal Coverage Scheme beneficiaries can most realistically access care.

Capacity and drivers of participation

Of the 196 respondents, 176 answered the intent-to-join item: 59 (33.5%) were interested, 79 (44.9%) uncertain, and 38 (21.6%) not interested; the remaining 20 gave no response and were excluded from analyses of intent. Combining interested and uncertain responses, 138 of 176 (78.4%) were willing or potentially willing to participate in the proposed scheme. One hundred and thirty-four of 176 respondents (76.1%) reported their clinic was still accepting new basic-care patients, with the remaining 42 (23.9%) reporting they had reached capacity. Regional joiner proportions varied from 50.0% in the North (3 of 6) to 91.1% in the South (41 of 45), reflecting both small subgroup sizes and the regional sampling deviations noted above (Table 1).

Ranked by mean Likert response, the seven decision drivers fell into three clusters (Table 2). The three financial and operational drivers were rated highest: fee-schedule level (69.3% rated high influence, mean 2.63), payment speed (67.7%, 2.60), and administrative burden (67.7%, 2.58). Community-service motivation occupied an intermediate position (46.0% high, mean 2.26). The remaining three drivers were consistently rated lower: treatment-scope coverage (27.5% high), external quality audit (22.2%), and public image of treating UC patients (19.0%).

Table 2

Drivers of dentists' decision to participate in the proposed public–private partnership scheme (n = 189 responding)

Driver	n responding	Low influence (1)n (%)	Medium (2)n (%)	High influence (3)n (%)	Mean Likert
Fee-schedule level	189	12 (6.3%)	46 (24.3%)	131 (69.3%)	2.63
Payment speed	189	15 (7.9%)	46 (24.3%)	128 (67.7%)	2.60
Administrative burden	189	18 (9.5%)	43 (22.8%)	128 (67.7%)	2.58
Community-service motivation	189	37 (19.6%)	65 (34.4%)	87 (46.0%)	2.26
Treatment-scope coverage	189	61 (32.3%)	76 (40.2%)	52 (27.5%)	1.95
External quality audit	189	77 (40.7%)	70 (37.0%)	42 (22.2%)	1.81
Public image of UC-treating clinic	189	88 (46.6%)	65 (34.4%)	36 (19.0%)	1.72

Likert response options: 1 = low influence, 2 = medium, 3 = high. Drivers ordered by descending mean. Driver items were completed by 189 of 196 respondents; seven did not complete the driver-rating block.

In bivariate analysis, six predictors were associated with intent at $p < 0.05$ (Table 3). Capacity carried the largest effect by far: 117 of 134 (87.3%) clinics still accepting new patients intended to join, against 21 of 42 (50.0%) at capacity ($p < 0.001$). Intent also declined with age and varied by region. Civil-service experience ran counter to expectation, with non-joiners having accumulated more civil-service years than joiners, and of the seven drivers only community-service motivation differed by intent. Sex, ownership, opening hours, chair count, and patient throughput showed no association.

Table 3

Bivariate associations with intent to join the proposed public–private partnership scheme (n = 176)

Characteristic	Joined (n = 138)	Did not join (n = 38)	p
Dentist sex			1.00
• Male	63 (77.8%)	18 (22.2%)	
• Female	75 (78.9%)	20 (21.1%)	
Civil-service experience			0.24
• Never	26 (68.4%)	12 (31.6%)	
• Past civil servant only	72 (80.9%)	17 (19.1%)	
• Currently civil servant	40 (81.6%)	9 (18.4%)	
Macro region			0.043
• Bangkok	33 (70.2%)	14 (29.8%)	
• Central	34 (75.6%)	11 (24.4%)	
• North	3 (50.0%)	3 (50.0%)	
• Northeast	26 (83.9%)	5 (16.1%)	
• South	41 (91.1%)	4 (8.9%)	
Age group			0.044
• <30 yr	11 (91.7%)	1 (8.3%)	
• 30–39	51 (85.0%)	9 (15.0%)	
• 40–49	36 (80.0%)	9 (20.0%)	
• 50–59	28 (73.7%)	10 (26.3%)	
• ≥60	11 (55.0%)	9 (45.0%)	
Ownership role			0.53
• Owner	125 (77.6%)	36 (22.4%)	
• Partner	13 (86.7%)	2 (13.3%)	
Capacity for new basic-care patients			< 0.001
• Still accepting	117 (87.3%)	17 (12.7%)	
• At capacity	21 (50.0%)	21 (50.0%)	
Open weekend			1.00

Characteristic	Joined (n = 138)	Did not join (n = 38)	p
• No	1 (100.0%)	0 (0.0%)	
• Yes	137 (78.3%)	38 (21.7%)	
Open evening			1.00
• No	12 (80.0%)	3 (20.0%)	
• Yes	126 (78.3%)	35 (21.7%)	
Age (yr), median (IQR)	42 (34–51)	50 (39–56)	0.002
Number of dental units, median (IQR)	2 (2–3)	2 (2–3)	0.83
Patients/weekday, median (IQR)	10 (5–15)	10 (6–15)	0.90
Patients/weekend-day, median (IQR)	12 (10–20)	15 (10–25)	0.45
Days open per week, median (IQR)	7 (6–7)	7 (6–7)	0.13
Total civil-service years, median (IQR)	0 (0–1)	1 (0–9)	0.02
Driver ratings (1–3), median (IQR)			
• Fee-schedule level	3 (2–3)	3 (2–3)	0.20
• Payment speed	3 (2–3)	3 (2–3)	0.16
• Administrative burden	3 (2–3)	3 (3–3)	0.45
• Community-service motivation	3 (2–3)	2 (1–3)	0.006
• Treatment-scope coverage	2 (1–3)	2 (1–2)	0.70
• External quality audit	2 (1–2)	2 (1–3)	0.28
• Public image	2 (1–2)	2 (1–3)	0.10

p-values are two-sided (χ^2 /Fisher for categorical, Mann–Whitney *U* for continuous and ordinal; see Methods). ‘Joined’ is the binary ‘willing or potentially willing’ outcome (interested + uncertain); 20 respondents who gave no answer are excluded (analytic *n* = 176).

The pattern held after adjustment (Table 4). At-capacity clinics had 88% lower adjusted odds of joining (aOR 0.12, 95% CI 0.05–0.32); no other demographic or structural predictor was robustly associated, including both civil-service categories, and only the South-versus-Bangkok contrast approached significance (*p* = 0.05). The capacity association persisted in sensitivity refits excluding the two sampling-deviation regions (aOR 0.08–0.11, both *p* < 0.001; Additional file 2: Table S1). The association was also stable across specifications and survived adjustment for objective capacity proxies, which were not themselves associated with intent (Additional file 2: Table S2).

Table 4
Multivariable logistic regression of PPP join intent – demographics and clinic structure

Variable	Adjusted OR (95% CI)	p
Past civil servant only (vs Never)	1.14 (0.38–3.41)	0.82
Currently civil servant (vs Never)	0.92 (0.22–3.77)	0.91
Female (vs Male)	0.70 (0.26–1.87)	0.48
Age < 30 (vs 30–39)	1.61 (0.16–15.84)	0.69
Age 40–49 (vs 30–39)	1.24 (0.35–4.44)	0.74
Age 50–59 (vs 30–39)	0.63 (0.16–2.43)	0.51
Age ≥ 60 (vs 30–39)	0.39 (0.08–1.88)	0.24
Central (vs Bangkok)	0.99 (0.30–3.23)	0.98
South (vs Bangkok)	4.11 (1.00–16.84)	0.050
Northeast (vs Bangkok)	2.31 (0.53–10.13)	0.27
North (vs Bangkok)	0.32 (0.04–2.25)	0.25
Partner (vs Owner)	3.67 (0.54–24.81)	0.18
At capacity (vs Accepting)	0.12 (0.05–0.32)	< 0.001
Number of dental units (per + 1)	0.92 (0.70–1.22)	0.56
Open evening (any day)	0.72 (0.12–4.49)	0.73
Model n	173	
Pseudo-R ² (McFadden)	0.223	
Log-likelihood	-69.7	

Reference categories: civil-service experience = Never; sex = Male; age = 30–39; region = Bangkok; ownership = Owner; capacity = Still accepting. OR = odds ratio. Driver ratings are modelled separately (Table 5). Three observations excluded for missing predictors (one missing age group, two missing health region).

Adding the seven driver ratings (Table 5) left the picture unchanged. The financial and operational drivers most often rated high, namely fee schedule, payment speed, and administrative burden, did not discriminate joiners from non-joiners after adjustment (all $p > 0.15$). The two value-laden drivers were significant with opposite signs: community-service motivation was positively associated with joining (aOR 2.52, 95% CI 1.27–4.97) and public-image concern negatively (aOR 0.46, 95% CI 0.23–0.92). Capacity remained the strongest structural correlate (aOR 0.15).

Table 5
Multivariable logistic regression of PPP join intent – Table 4 model with seven driver
Likert items added

Variable	Adjusted OR (95% CI)	p
Past civil servant only (vs Never)	1.33 (0.41–4.36)	0.64
Currently civil servant (vs Never)	1.13 (0.25–5.06)	0.87
Female (vs Male)	0.78 (0.27–2.28)	0.65
Age < 30 (vs 30–39)	0.87 (0.08–9.67)	0.91
Age 40–49 (vs 30–39)	1.05 (0.26–4.22)	0.95
Age 50–59 (vs 30–39)	0.58 (0.14–2.42)	0.46
Age ≥ 60 (vs 30–39)	0.34 (0.06–1.99)	0.23
Central (vs Bangkok)	1.14 (0.27–4.89)	0.86
South (vs Bangkok)	3.22 (0.68–15.38)	0.14
Northeast (vs Bangkok)	1.89 (0.40–8.85)	0.42
North (vs Bangkok)	0.33 (0.04–2.96)	0.33
Partner (vs Owner)	2.58 (0.33–19.89)	0.36
At capacity (vs Accepting)	0.15 (0.05–0.44)	< 0.001
Number of dental units (per + 1)	0.99 (0.72–1.36)	0.94
Open evening (any day)	0.50 (0.06–4.31)	0.53
Driver: Fee-schedule level (per + 1 Likert)	1.83 (0.77–4.38)	0.17
Driver: Payment speed (per + 1)	1.33 (0.60–2.95)	0.48
Driver: Administrative burden (per + 1)	0.83 (0.38–1.83)	0.65
Driver: Community-service motivation (per + 1)	2.52 (1.27–4.97)	0.008
Driver: Treatment-scope coverage (per + 1)	1.31 (0.65–2.61)	0.45
Driver: Audit (per + 1)	1.03 (0.54–1.94)	0.94
Driver: Public image (per + 1)	0.46 (0.23–0.92)	0.03
Model n	173	
Pseudo-R ² (McFadden)	0.289	
Log-likelihood	-63.8	

Table 4 model with the seven driver items (1 = low, 3 = high) added as continuous predictors; each OR is per one-point increase. Reference categories as in Table 4.

The uncertain group as a persuadable margin

Of the 176, 79 (44.9%) were uncertain rather than committed, the largest single group. In an exploratory three-level model (baseline = interested; Table 6), the uncertain were distinguished from committed joiners chiefly by administrative-burden sensitivity (RRR 2.93, 95% CI 1.44–5.96), whereas the not-interested were distinguished by lower community-service motivation (RRR 0.35) and greater public-image concern (RRR 2.25), and by being at capacity (RRR 9.85, 95% CI 2.59–37.51), the last estimated imprecisely given the small not-interested class (n = 37) and read as directional. The uncertain thus resemble committed joiners structurally but condition participation on operational terms, administrative burden above all, that contract design can modify. The North contained no interested respondents, so its regional estimates are not interpreted.

Table 6
Three-level multinomial logistic regression of join intent (baseline = interested): relative risk ratios (95% CI)

Predictor	Uncertain vs Interested	Not interested vs Interested
Administrative burden (per + 1 Likert)	2.93 (1.44–5.96)	2.02 (0.89–4.62)
Fee-schedule level (per + 1)	2.04 (0.88–4.77)	1.01 (0.39–2.62)
Payment speed (per + 1)	1.00 (0.46–2.18)	0.79 (0.32–1.94)
Community-service motivation (per + 1)	0.66 (0.35–1.22)	0.35 (0.16–0.76)
Public image (per + 1)	1.28 (0.68–2.41)	2.25 (1.05–4.83)
At capacity (vs accepting)	3.06 (0.87–10.73)	9.85 (2.59–37.51)
Open evening (any day)	0.11 (0.01–0.80)	0.38 (0.03–4.63)

Three-level outcome (baseline = interested), n = 173, Firth-type penalised estimation (brglm2). RRR = relative risk ratio per one-point Likert increase or versus the reference category. The model adjusts for the full structural set and all seven drivers; only the most informative predictors are shown. Classes are small (58/78/37), so estimates are read by direction. Full coefficients are available from the corresponding author.

Price structure and acceptance of the proposed partnership fee schedule

The 196 clinics reported current 2019 prices for 13 routine outpatient services with median values spanning 150 baht for a single dental x-ray film to 7,000 baht for a complete denture per arch (Table 7). Dentists were then asked for the price they would consider acceptable for participation in the proposed Universal Coverage Scheme PPP. The dentist-expected price lay below the current charge for 12 of 13

services. The single exception was the complete denture per arch, for which the dentist-expected median was 9,000 baht against a current median of 7,000 baht. Prices are reported in 2019 nominal baht throughout. In international dollars the 2019 current-price range runs from int\$13 for a single x-ray film to int\$592 for a complete denture per arch [28]. For illustration only, applying a cumulative general Consumer Price Index factor of 1.09 [27] places the current-price column at roughly 164–7,630 baht in 2026 terms (Table 7); this general-inflation adjustment is not specific to dental input costs and should not be read as a current cost estimate.

Table 7

Current 2019 prices, dentist-expected prices, and proposed PPP fees, by service (with illustrative 2026 CPI-adjusted equivalents)

Service	Current 2019 (THB)n, median (IQR)	Current 2026, illustrative (THB)median (IQR)	Dentist-expected (THB)n, median (IQR)	Proposed PPP fee (THB)	Accept proposedn (%)
Fluoride application	n = 158; 400 (300–500)	436 (327–545)	n = 162; 300 (200–300)	100	18 (9.5%)
Sealant (per tooth)	n = 167; 400 (325–500)	436 (354–545)	n = 170; 300 (250–350)	250	79 (41.8%)
Scaling (per visit)	n = 192; 700 (600–900)	763 (654–981)	n = 177; 600 (500–700)	400	42 (22.2%)
Simple extraction (per tooth)	n = 45; 600 (500–700)	654 (545–763)	n = 180; 500 (400–500)	350	43 (22.9%)
Filling, 1 surface	n = 191; 600 (500–700)	654 (545–763)	n = 183; 450 (350–500)	350	52 (27.7%)
Filling, 2 surfaces	n = 190; 800 (700–1000)	872 (763–1090)	n = 183; 600 (500–800)	400	20 (10.6%)
Filling, > 2 surfaces	n = 188; 1050 (900–1500)	1144 (981–1635)	n = 182; 800 (600–1000)	500	24 (12.8%)
Surgical extraction (per tooth)	n = 180; 2500 (1950–3000)	2725 (2126–3270)	n = 166; 1500 (1500–2000)	1500	82 (43.6%)
Pulpotomy (primary tooth)	n = 77; 1200 (1000–1500)	1308 (1090–1635)	n = 73; 800 (500–1000)	480	18 (9.6%)
Pulpectomy (primary tooth)	n = 86; 1600 (1500–2500)	1744 (1635–2725)	n = 77; 1200 (970–1500)	970	28 (14.9%)
Dental x-ray (per film)	n = 182; 150 (120–200)	164 (131–218)	n = 178; 100 (100–100)	100	140 (74.5%)
Partial denture (per jaw)	n = 183; 1800 (1500–2350)	1962 (1635–2562)	n = 154; 1500 (1500–2000)	1500	88 (46.8%)
Complete denture (per arch)	n = 180; 7000 (5000–9000)	7630 (5450–9810)	n = 178; 9000 (7000–10000)	7000	60 (31.9%)

Values are THB, 2019 nominal. Dentist-expected = price stated as acceptable for participating; proposed fee = the UCS primary-care schedule communicated at interview; 'accept proposed' = rated that fee acceptable, with 'don't know' in the denominator. Simple extraction n = 45, the item having been added partway through fieldwork. The 2026 column is illustrative (CPI 1.09, not dental-specific). International dollars = THB ÷ 11.83 (World Bank PPP factor, Thailand 2019).

We tested the within-respondent gap between current and dentist-expected prices using paired Wilcoxon signed-rank tests, with p-values Holm-adjusted across the 13 services (Table 8). Twelve of 13 services showed a statistically significant gap at Holm-adjusted $p < 0.001$; the partial denture per jaw was the only service for which the gap (current 1,800 vs expected 1,500 baht) did not reach significance (Holm-adjusted $p = 0.23$). Surgical extraction carried the largest positive gap, with a current median of 2,500 baht against an accepted 1,500 baht, the proposed fee of 1,500 baht matching the dentist-expected median exactly. The complete denture per arch produced the only inversion in the dataset: the dentist-expected median (9,000 baht) exceeded the current charge (7,000 baht) by 2,000 baht, against a proposed fee of 7,000 baht.

Table 8
Per-service current vs dentist-expected price gap and proposed-fee acceptance (paired Wilcoxon, Holm-adjusted)

Service	n paired	Current median (THB)	Expected median (THB)	Δ (THB)	p (Holm-adj)	Proposed PPP fee (THB)	Accept (95% CI)
Fluoride application	148	400	300	+ 100	< 0.001	100	9.5% (6.1–14.6)
Sealant (per tooth)	162	400	300	+ 100	< 0.001	250	41.8% (35.0–48.9)
Scaling (per visit)	177	700	600	+ 100	< 0.001	400	22.2% (16.9–28.7)
Simple extraction (per tooth)	44	600	500	+ 100	< 0.001	350	22.9% (17.4–29.4)
Filling, 1 surface	183	600	450	+ 150	< 0.001	350	27.7% (21.8–34.5)
Filling, 2 surfaces	182	800	600	+ 200	< 0.001	400	10.6% (7.0–15.9)
Filling, > 2 surfaces	179	1000	800	+ 200	< 0.001	500	12.8% (8.7–18.3)
Surgical extraction (per tooth)	164	2500	1500	+ 1000	< 0.001	1500	43.6% (36.7–50.8)
Pulpotomy (primary tooth)	65	1200	800	+ 400	< 0.001	480	9.6% (6.1–14.6)
Pulpectomy (primary tooth)	72	1600	1200	+ 400	< 0.001	970	14.9% (10.5–20.7)
Dental x-ray (per film)	177	150	100	+ 50	< 0.001	100	74.5% (67.8–80.2)
Partial denture (per jaw)	151	1800	1500	+ 300	0.23	1500	46.8% (39.8–53.9)
Complete denture (per arch)	174	7000	9000	-2000	< 0.001	7000	31.9% (25.7–38.9)

Paired Wilcoxon signed-rank test (current 2019 vs dentist-expected), Holm-adjusted across the 13 services. Medians use each service's paired complete-case subsample and may differ slightly from Table 7. Acceptance = proportion rating the proposed fee acceptable among all respondents asked, including 'don't know' (Wilson 95% CI). Positive Δ = current exceeds dentist-expected; complete denture is the reverse.

Acceptance of the proposed fee schedule was elicited per service as a four-option rating (acceptable, too high, too low, don't know); we report the proportion rating the fee acceptable among all respondents asked (Table 8). Acceptance proportions ranged from 9.5% (95% CI 6.1–14.6) for fluoride application to 74.5% (67.8–80.2) for dental x-ray. Four services exceeded 40% acceptance: dental x-ray (74.5%), partial denture (46.8%), surgical extraction (43.6%) and sealant (41.8%). Five services fell below 15%: fluoride application (9.5%), pulpotomy of primary teeth (9.6%), two-surface filling (10.6%), filling of more than two surfaces (12.8%) and pulpectomy of primary teeth (14.9%). The 65-percentage-point spread reflects how unevenly the schedule was aligned with providers' stated acceptable prices. Expressed as a fraction of the dentist-expected median, the proposed fee ranged from 0.33 for fluoride application to parity (1.00) for dental x-ray, surgical extraction and partial denture per jaw, and that fraction was strongly associated with acceptance across the 13 services (Spearman $\rho = 0.93$; post hoc, not pre-specified). Acceptance therefore tracked the service-specific discount rather than the schedule as a whole. This heterogeneity is the empirical context for the fee-schedule design discussion that follows.

Discussion

Spare capacity is the strongest correlate of participation intent

The single strongest correlate of intent to join the proposed public–private partnership scheme was the clinic's spare capacity to accept new basic-care patients. The association strengthened rather than weakened after adjustment, with at-capacity status carrying an adjusted odds ratio of 0.12 against intent to join (Table 4), and it survived removal of both sampling-deviation regions (Additional file 2: Table S1). Mapped onto the Levesque framework [23], this is a finding about the supply-side availability–accommodation dimension: the latent pool of clinics willing to engage in publicly contracted dental work is not uniformly distributed but is concentrated in clinics with absorbable workload. Private-sector engagement in the Universal Coverage Scheme is unlikely to scale by lowering fee schedules alone; our findings suggest recruitment strategies that screen directly for spare capacity rather than inferring it from clinic type or location, since our data do not identify which structural characteristics predict absorbable workload. A widely cited review of low- and middle-income country contracting-out experience identified contract design and contextual factors as principal determinants of success but, to our reading, did not foreground provider-level spare capacity as a screening tool for purchaser recruitment [13]. The 2026 NHSO innovation framework anticipated this constraint in principle without operationalizing capacity screening into the dental contracting workflow [30].

Readiness and supply run in opposite directions

Willingness was not uniform across the country, and its geography runs counter to the geography of supply. The proportion willing or potentially willing was lowest in Bangkok (70.2%) and highest in the South (91.1%) and the Northeast (83.9%), and the South-versus-Bangkok contrast was the only regional signal to approach significance after adjustment (adjusted odds ratio 4.11, 95% confidence interval 1.00–16.84, $p = 0.05$; Table 4). The private stock runs the other way, with more than a third of the 4,681 registered clinics in Bangkok alone [11]; nearly half of the willing clinics in our sample, 67 of 138, were in Bangkok or the Central macro-region. Provider reluctance is therefore not the binding constraint in the under-supplied regions; the number of private clinics is. Contracting can mobilize willing capacity, but it cannot relocate it.

Prior civil-service experience does not independently predict joining

A plausible hypothesis is that dentists with prior or current civil-service experience would be more receptive to publicly contracted work, given their familiarity with state-sector administrative routines and patient mix. Our data did not support this hypothesis. Although the bivariate proportion of joiners was somewhat higher among current and past civil servants than among never-civil-servant dentists, the difference was not significant (Table 3); after adjustment for age, sex, region, ownership, and capacity, both civil-service categories produced odds ratios close to 1 with wide confidence intervals (Table 4). The null persisted in the driver-augmented model (Table 5) and across all three sampling sensitivities (Additional file 2: Table S1), and the only bivariate signal ran in the opposite direction, with non-joiners reporting more accumulated civil-service years than joiners (Table 3). The path-dependence hypothesis, which posits a stable civil-service habitus carried into private practice, found no support in this cohort of clinic-owning dentists, although the wide confidence intervals do not exclude moderate effects in either direction. Policy levers that assume prior public-sector exposure as a recruitment shortcut may therefore yield smaller returns than expected. The principal–agent framing [14] is informative here: provider acceptability of public-purchaser contracting appears to be set by current operational conditions rather than by sectoral biography.

Financial and operational drivers do not discriminate; value-laden drivers do

The seven driver items elicited in the survey produced two distinct patterns when entered into the adjusted model (Table 5). The three financial and operational drivers most commonly rated high in descriptive analysis, namely fee-schedule level, payment speed, and administrative burden, did not discriminate joiners from non-joiners after adjustment (Table 5), consistent with their being universal concerns rather than determinants. The two value-laden drivers reached significance with opposite signs: community-service motivation was positively associated with intent to join, and concern about public image when treating Universal Coverage beneficiaries was negatively associated (Table 5). We caution that these driver ratings were elicited concurrently with the join-intent question and may reflect post-decision rationalization rather than antecedent motivation. Even with that caveat, the contrast is

instructive: communications strategy by the National Health Security Office and provincial health authorities should foreground the social-mission framing of the scheme while addressing the public-image concern associated with treating Universal Coverage beneficiaries. This split is consistent with the public-services-specific knight–knave typology of Le Grand [31], in which provider behaviour responds to a mix of altruistic and self-interested motives and policy design must address both. Three-level modelling sharpens this reading. The uncertain group, the largest single response category at 44.9%, was distinguished from committed joiners chiefly by administrative-burden sensitivity (RRR 2.93, 95% CI 1.44–5.96; Table 6), identifying a persuadable margin that contract simplification, rather than fee competition alone, may be best placed to convert. Cross-setting evidence points the same way: in the United States, dentist participation in public insurance programmes remains limited and geographically uneven despite long-standing fee debate [32], and realist-review evidence from high-income systems identifies ceded clinical control and mistrust of the system as central mechanisms of disengagement from state-funded dental contracts [19]. Community-service motivation and public-image concern, by contrast, separated the firmly not-interested from joiners, indicating that value-based recruitment reaches the committed but not the conditional.

Price-gap evidence and fee-schedule design

Across 13 routine outpatient services, current private prices differed significantly from dentists' own stated acceptable price for participation in the proposed scheme for 12 of 13 services (Holm-adjusted $p < 0.001$; Table 8), exceeding it in 11 and falling below it for the complete denture per arch. The single non-significant gap was partial denture per jaw (1,800 vs 1,500 baht). Three results warrant emphasis for fee-schedule design. Surgical extraction matched dentists' expected price exactly at 1,500 baht despite a sizeable gap against current charges. The complete denture per arch produced the only inversion in the dataset, with dentists expecting 9,000 baht under the scheme against a current charge of 7,000 baht, suggesting that the chair-time and laboratory components of denture work are not captured in the proposed bundled fee. And acceptance of the actually proposed fee schedule varied 65 percentage points across services (Table 8). The proposed fee sat furthest below the dentist-expected median for fluoride application (100 vs 300 baht) and pulpotomy of primary teeth (480 vs 800 baht), the two services with the lowest acceptance (9.5% and 9.6%), whereas dental x-ray, surgical extraction, and partial denture, for which the proposed fee matched the dentist-expected median, recorded the three highest acceptance rates (74.5%, 43.6%, and 46.8%). This spread is close to a function of the service-specific discount: acceptance tracked how near the proposed fee sat to providers' own stated acceptable price (Spearman $\rho = 0.93$), and the schedule's alignment varied sharply from service to service. Within the Levesque affordability dimension and the principal–agent perspective on contractual design [23, 14], aligning the schedule more closely with providers' stated acceptable prices, and commissioning a cost-of-delivery study to inform case-mix adjustment for complex prosthetics, would plausibly strengthen participation incentives. We measured stated acceptable prices rather than production costs, so a dedicated cost-of-delivery study is the recommendation our data support most directly. The tested schedule was an operating administrative tariff rather than a hypothetical construct, with core treatment rates subsequently codified in the Bangkok primary-care fee schedule [33]; the 2026

national payment notification instead adopted a bundled per-visit payment of 700 baht — int\$69 at the 2025 parity factor, the most recent published [28], and therefore not directly comparable with the 2019 figures above — covering the basic-service set [30], so we read the price-gap findings as evidence on providers' service-by-service price sensitivity rather than as a direct evaluation of the tariffs now in force. The scoping-review evidence on payment-mechanism trade-offs is consistent with this direction [24].

Equity factors in enrolment and payment design

The geographic and price findings identify three margins on which a dental contracting scheme is not equity-neutral by default, and three corresponding design factors.

Who is contracted. Capacity screening is operationally efficient but blind to need, and the private stock is densest where access is already best, so a capacity rule applied nationally will concentrate contracts in well-served areas. Applying the same rule within geographic strata, with a share of contracts reserved for under-supplied provinces, preserves the operational logic while directing the result toward equity; our data suggest the willingness to fill such places exists.

What relative prices providers face. The schedule we tested was not a uniform discount. Its deepest discounts fell on preventive and paediatric services, which drew the lowest acceptance, while diagnosis and surgical extraction were priced at parity and drew the highest. A schedule with that structure carries a relative-price signal favouring extraction over prevention in precisely the services where the equity return is greatest. Correcting the relative weights so that preventive and child items sit nearer providers' accepted prices is achievable within an unchanged overall envelope and is, on our data, the cheapest equity lever available in the instrument; because we measured stated acceptable prices rather than production costs, that re-weighting should be informed by the cost-of-delivery study recommended above.

Which patients providers are paid to see. The national scheme has moved from an itemized schedule to a flat per-visit bundle [30]. A bundle that does not vary with patient need pays the same for a straightforward and for a complex patient, and the scoping-review evidence identifies patient selection as the characteristic failure mode of prospective payment without adequate risk adjustment [24]. Our service-level results show provider response to be sensitive to the relation between payment and the effort a service demands; the same sensitivity applied to patients rather than services implies that need-based case-mix adjustment, rather than the headline bundle rate, is the equity-relevant parameter in the instrument now in force — though that adjustment presupposes the purchaser can observe and verify patient need, which is itself a non-trivial design requirement. We have no post-rollout data with which to test this, and offer it as a design implication rather than a finding.

National-context bridge to the post-2024 payment redesign

Our fieldwork predates both the COVID-19 pandemic and the national One ID Card Treats Anywhere scheme, which scaled private-provider dental contracting from 2024; the survey therefore provides a pre-rollout baseline of supply-side readiness rather than an evaluation of the redesign. Because the survey preceded any national contracting offer, the willingness and capacity estimates are unaffected by self-selection into the scheme, a property no post-rollout provider survey can recover. Three features of the early rollout are consistent with that baseline and indicate why it remains informative. First, realized participation has fallen well below stated willingness: by mid-2026, 2,005 private clinics had registered with the scheme and 1,672 were actively delivering services [34], approximately 30% and 25% respectively of the roughly 6,600 registered private dental clinics recorded nationally as of February 2024 [35]. Active participation therefore sits below even the 33.5% firmly interested, and far below the 78.4% willing or potentially willing, although the registry-wide and survey-sample proportions rest on different denominators and are only broadly comparable. Second, joining clinics reported the greatest difficulty with the administrative steps of enrolment and reimbursement, the same administrative-burden dimension that distinguished our uncertain, persuadable group [36]. Third, joining clinics drew on spare capacity, reporting longer queues after enrolment, the supply-side dimension most strongly associated with willingness in our data [36]. A separate post-rollout study found that fee adequacy, not the factors associated with joining, was associated with intention to remain [37], suggesting the binding condition shifts from entry to retention along the participation pathway. Early experience in Canada points in the same direction: initial confusion over coverage and payment processes deterred clinic enrolment in the Canadian Dental Care Plan, yet once these administrative uncertainties resolved, close to 90% of oral-health providers had joined by mid-2025 despite fees set below provincial fee guides [38]. These high-income comparators differ from Thailand in financing and dental-market structure; we draw on them for mechanism-level parallels in provider behaviour under public contracting, not as evidence of direct transferability, and comparable supply-side data from other low- and middle-income systems are needed to test transfer directly. We do not evaluate the redesign here; that requires post-2024 utilization, expenditure, and provider-side data outside our sampling window.

Limitations

Six limitations qualify these findings. The response rate was 49.5% (196 of 396), with deviations in Health Regions 5 and 11; refits excluding them left the estimates unchanged (Additional file 2: Table S1), but the 4% response in Region 5 weakens the Central macro-region, and unweighted regional comparisons should be read with caution. The 20 respondents missing the intent item clustered in the North (12 of 20), so its small denominator reflects item non-response. Preferences are stated, not revealed: the 78.4% combines interested and uncertain responses and is an upper bound; driver ratings were elicited alongside intent and may carry rationalization; stated prices may exceed true reservation prices; prior exposure to the provincial schemes was not captured. Fieldwork predates the pandemic and the 2024 rollout, so 2019 prices are a pre-pandemic baseline. Telephone administration limited probing into governance and contractual depth. This is one scheme in one jurisdiction. Events per variable were

low (2.5 and 1.7), so small-subgroup estimates are directional; robustness is in Additional file 2: Table S2.

Conclusions

This national survey of 196 Thai private dental clinics provides evidence on three components of supply-side readiness for public–private partnership in Universal Coverage dental services. Latent private-sector supply for publicly contracted dental work exists in Thailand, but mobilizing it is likely to require capacity-aware recruitment rather than rate competition alone. Willingness was associated with community-service motivation and public-image concern more than with financial salience, which was universally high. The proposed fee schedule was misaligned with providers’ own stated acceptable prices, with the largest mismatch for the complete denture per arch. Read as a pre-rollout baseline, these findings describe the conditions in place before participation and the margins where reimbursement and recruitment design warrant refinement. Equitable access motivated this study but was not an outcome we measured; the three design factors identified here — geographic targeting of enrolment, relative-price correction toward preventive and paediatric care, and need-based case-mix adjustment under bundled payment — are margins on which a contracting scheme's equity performance depends, and whether the post-2024 expansion of private-sector contracting narrows utilization inequities remains to be tested with post-rollout utilization data.

Abbreviations

AAPOR

American Association for Public Opinion Research

aOR

adjusted odds ratio

CI

confidence interval

CPI

consumer price index

HIC

high-income country

HWS

Health and Welfare Survey

int\$

international dollar (purchasing-power-parity adjusted)

IQR

interquartile range

LMIC

low- and middle-income country

NHSO

National Health Security Office

PPP

public–private partnership

RRR

relative risk ratio

SD

standard deviation

STROBE

Strengthening the Reporting of Observational Studies in Epidemiology

UC

Universal Coverage

UCS

Universal Coverage Scheme.

Declarations

Ethics approval and consent to participate

The study protocol was reviewed and approved by the Committee of Research Ethics, Faculty of Public Health, Chiang Mai University (Document No. ET008/2018; approval period 28 August 2018 to 28 August 2020). All participating clinics' owners or designated representatives provided verbal consent at the start of the telephone interview, after the study's purpose, voluntary nature, anonymization procedures, and data-handling protocol had been explained by the interviewer. Verbal-consent procedures were approved by the ethics committee as appropriate for a telephone-administered survey of professional respondents reporting on practice-level operational and pricing characteristics; no individual patient data were collected. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

TT is the owner and managing director of a private dental clinic in Ratchaburi province (D Prompt Dental Clinic Co., Ltd.). The clinic was established in 2025, five years after the fieldwork reported here was completed, and did not exist during the study period; it was not part of the survey sampling frame and had no role in the study design, data collection, analysis, interpretation, or manuscript preparation. The other authors declare that they have no competing interests.

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Author Contribution

TT, as corresponding author, conceived the research question, designed and performed the analysis, produced the visualizations, and drafted the manuscript. NC, as first author, contributed to the conceptualization, curated the analytic dataset, performed formal analysis, supervised the work, and administered the project. ST is the principal investigator of record for the parent study; he secured the funding, provided the survey resources and original data, and curated the source data. PG contributed to the methodology and validation. WT, PW, and TP contributed to the field investigation. All authors read and approved the final manuscript.

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Data Availability

The datasets used and analysed during the current study are available from the corresponding author on reasonable request, subject to a data-sharing agreement compatible with the ethics approval granted by the Committee of Research Ethics, Faculty of Public Health, Chiang Mai University. The version-controlled analysis scripts that reproduce the analytic dataset and all reported estimates are also available from the corresponding author on reasonable request.

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Figures

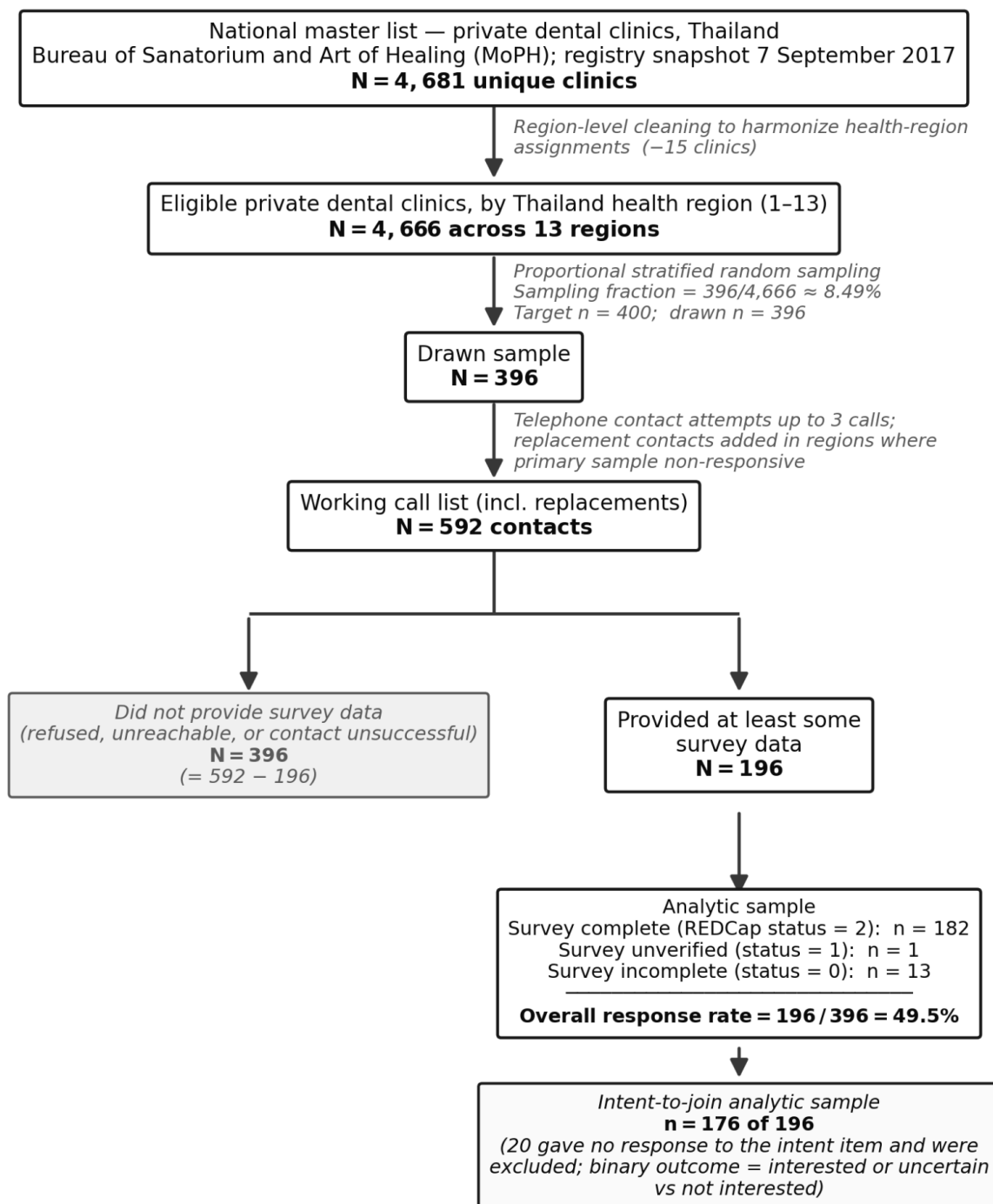


Figure 1

STROBE flow diagram of clinic-registry derivation, sampling and survey response, Thailand, 2019–2020

Sampling flow from 4,681 clinics on the national registry maintained by the Bureau of Sanatorium and Art of Healing (registry snapshot 7 September 2017), through 4,666 clinics assignable to the 13 National

Health Security Office health regions, to 396 clinics drawn by proportional stratified random sampling and 196 clinics interviewed (49.5% of the drawn sample). The working call list of 592 contacts includes 196 same-stratum replacements made to compensate for non-response within the drawn sample. Of the 196 respondents, 182 records were marked complete in REDCap, 1 was unverified and 13 were partial; 176 answered the intent-to-join item and form the analytic sample for the binary outcome (interested or uncertain versus not interested), the remaining 20 having given no response to that item. Two sampling-design deviations are disclosed: Health Region 5 (Western Central) yielded 1 respondent against a drawn target of 26 (region-specific response rate 4%), and Health Region 11 (Upper South) yielded 26 respondents against a drawn target of 21 (124% of target); both are addressed in the sensitivity analyses reported in Additional file 2 (Table S1). This figure is a diagram drawn from the study's own participant-flow counts; it was produced with plotting code written with the assistance of a generative artificial-intelligence assistant (Claude, Anthropic) and reviewed by the authors. No AI-generated imagery was used.

Supplementary Files

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