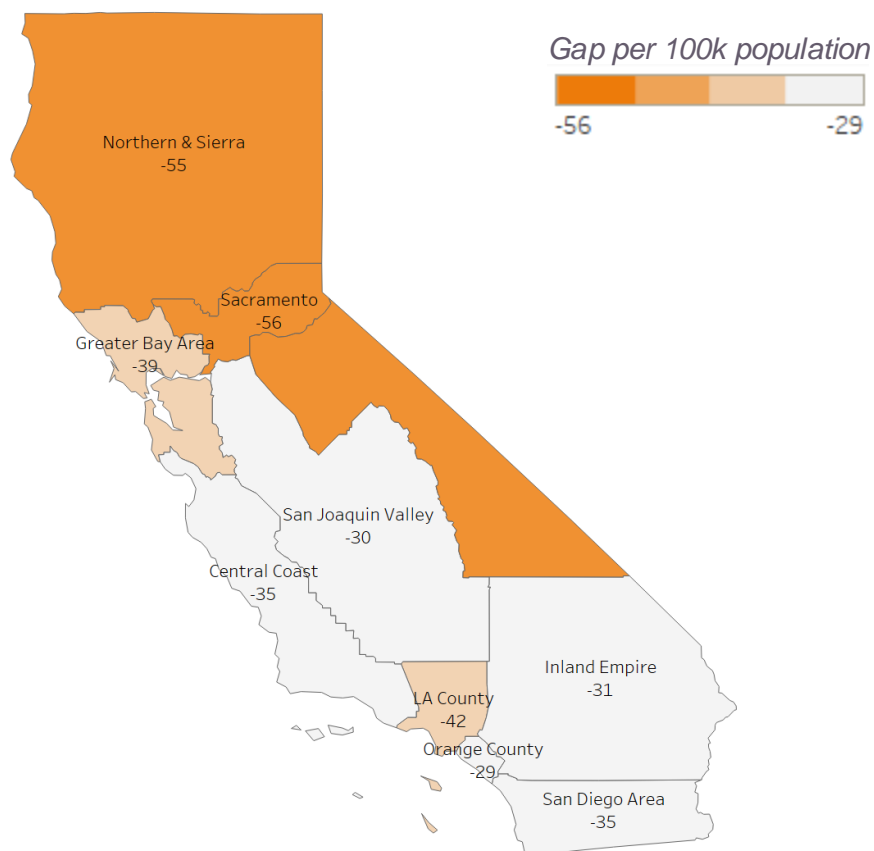

Appendix

Preliminary supply / demand modeling results by role

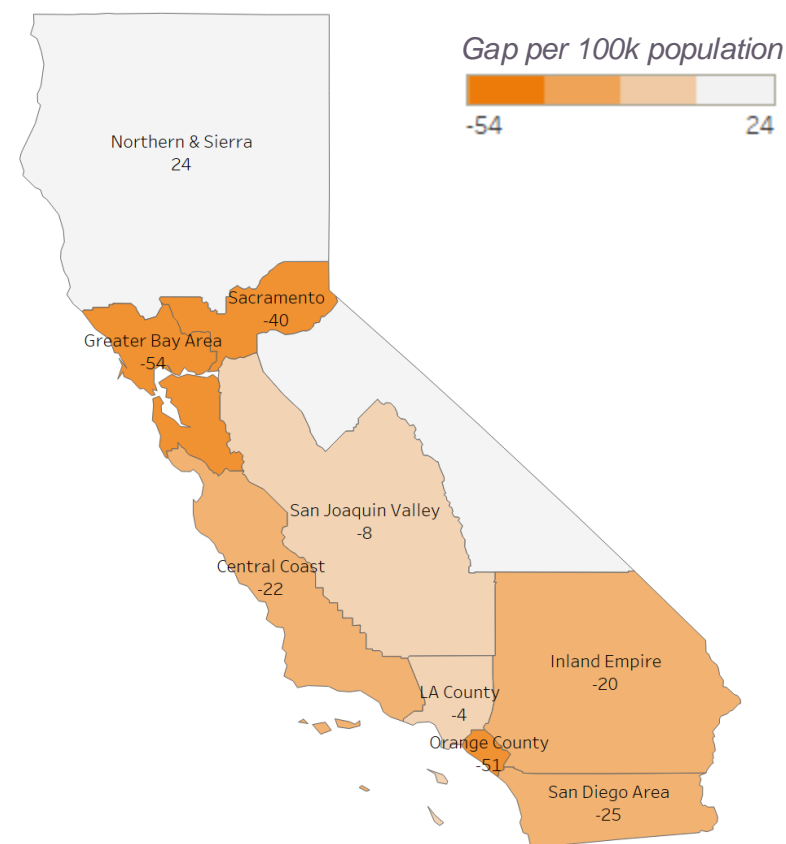
Behavioral Health

Non-prescribing associate level clinicians (region level)

Current state (2022) Non-prescribing associate behavioral health professional
Regional model gap relative to pop¹ (severe shortage, less severe shortage)²



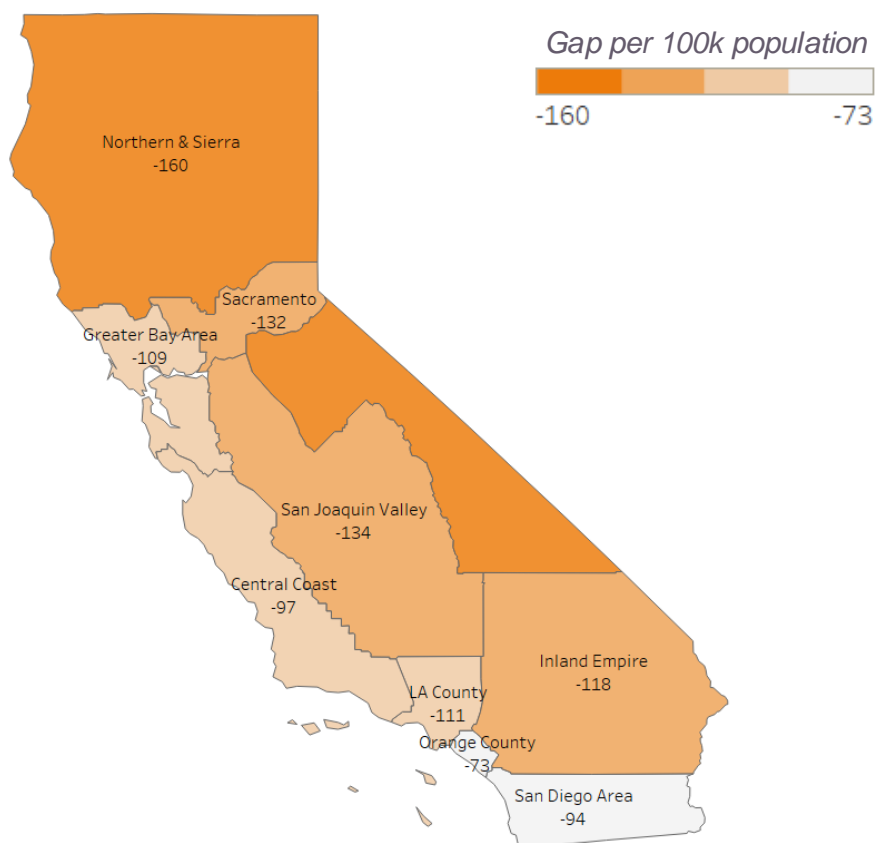
2033 forecast Non-prescribing associate behavioral health professional
Regional model gap relative to pop¹ (severe shortage, surplus)³



Note: Includes Associate Clinical Social Worker, Associate Marriage and Family Therapist, Associate Professional Clinical Counselor, and Registered Psychological Associate
1. Per 100k population 2. Min = -56, max = -29. 3. Min = -54, max = 24.

Non-prescribing licensed behavioral health professional (region level)

Current state (2022) Non-prescribing licensed behavioral health professional
Regional model gap relative to pop¹ (severe shortage, less severe shortage)²



2033 forecast Non-prescribing licensed behavioral health professional
Regional model gap relative to pop¹ (severe shortage, less severe shortage)³



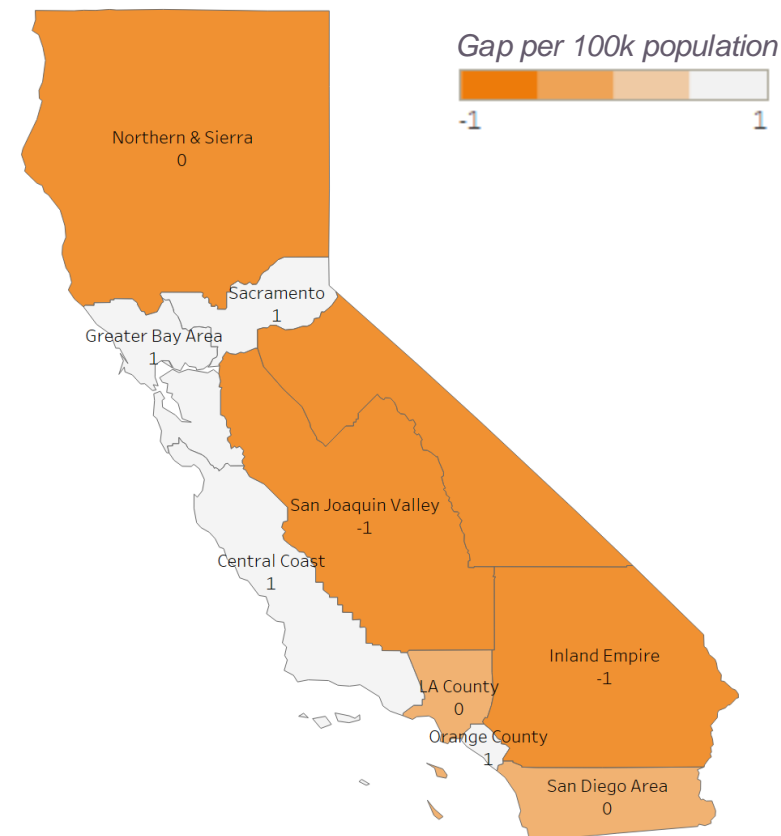
Note: Includes Licensed Clinical Social Worker, Licensed Marriage and Family Therapist, Licensed Professional Clinical Counselor, and Psychologist
 1. Per 100k population 2. Min = -160, max = -73. 3. Min = -209, max = -79.

Licensed educational psychologist (region level)

Current state (2022) License educational psychologist
Regional model gap relative to pop¹ (severe shortage, surplus)²



2033 forecast License educational psychologist
Regional model gap relative to pop¹ (severe shortage, surplus)³



1. Per 100k population 2. Min = -2, max = 2. 3. Min = -1, max = 1.

Peer support specialist (region level)

Current state (2022) Peer support specialist

Regional model gap relative to pop¹ (severe shortage, less severe shortage)²



2033 forecast Peer support specialist

Regional model gap relative to pop¹ (small surplus, larger surplus)³



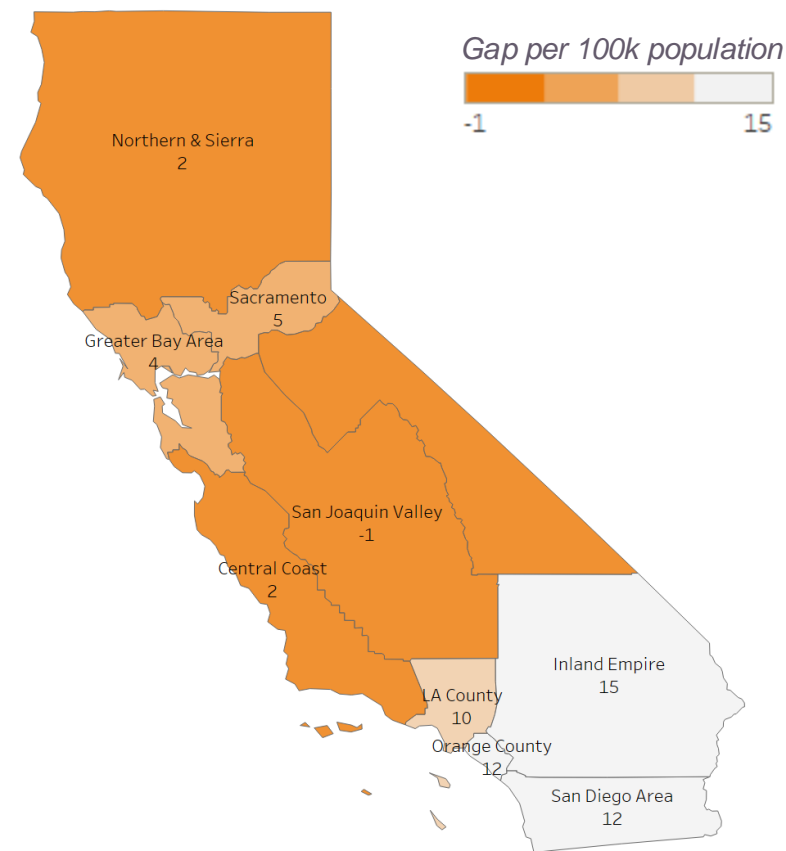
1. Per 100k population 2. Min = -8, max = -6. 3. Min = -5, max = 13.

Psychiatric mental health nurse practitioner (region level)

Current state (2022) Psychiatric mental health nurse practitioner
Regional model gap relative to pop¹ (severe shortage, less severe shortage)²



2033 forecast Psychiatric mental health nurse practitioner
Regional model gap relative to pop¹ (severe shortage, surplus)³



1. Per 100k population 2. Min = -6, max = -3. 3. Min = -1, max = 15.

Psychiatrist (region level)

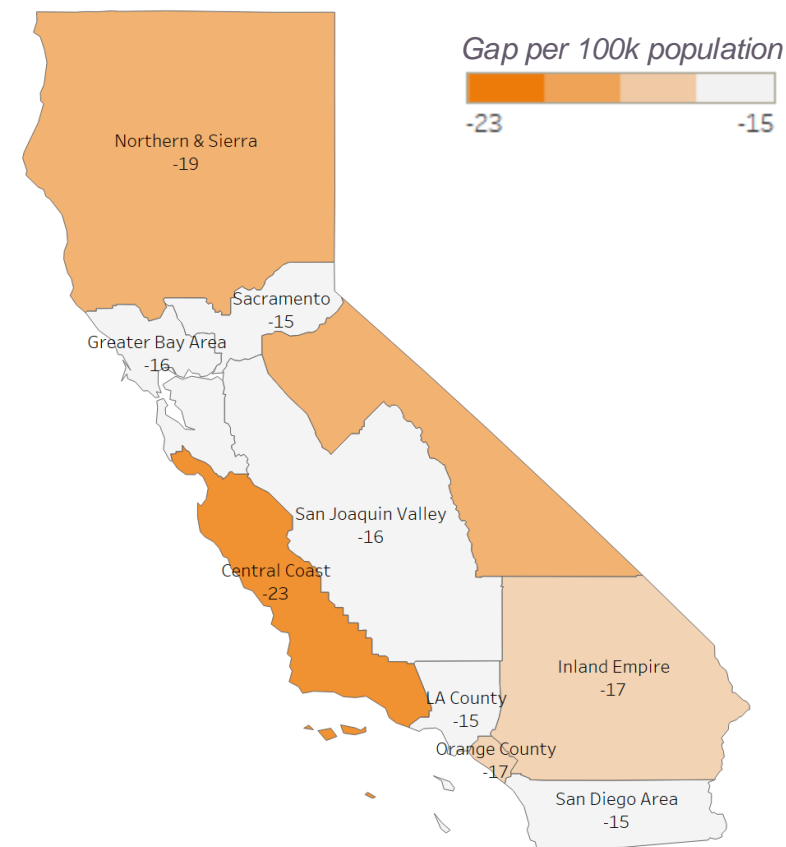
Current state (2022) Psychiatrist

Regional model gap relative to pop¹ (severe shortage, less severe shortage)²



2033 forecast Psychiatrist

Regional model gap relative to pop¹ (severe shortage, less severe shortage)³



1. Per 100k population 2. Min = -12, max = -6. 3. Min = -23, max = -15.

Substance use disorder counselor (region level)

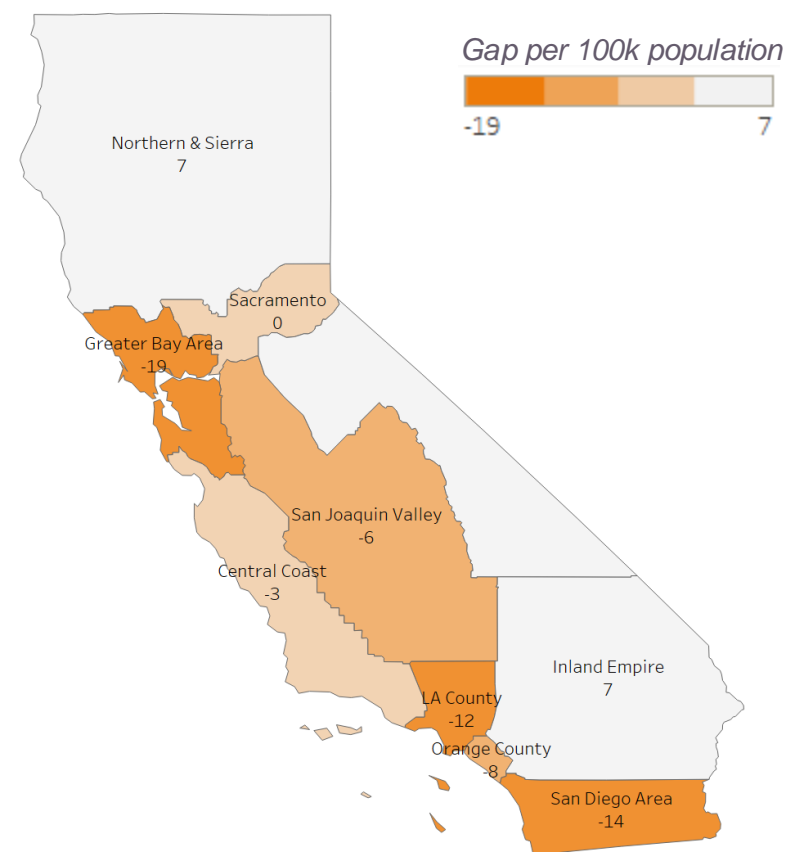
Current state (2022) Substance use disorder counselor

Regional model gap relative to pop¹ (severe shortage, surplus)²



2033 forecast Substance use disorder counselor

Regional model gap relative to pop¹ (severe shortage, surplus)³



1. Per 100k population 2. Min = -15, max = 6. 3. Min = -19, max = 7.

Nursing

Midwives (region level)

Current state (2022) Midwives

Regional model gap relative to pop¹ (shortage, surplus)²



2033 forecast Midwives

Regional model gap relative to pop¹ (shortage, surplus)³



1. Per 100k population 2. Min = -2, max = 0. 3. Min = -2, max = 1.

Nurse anesthetist (region level)

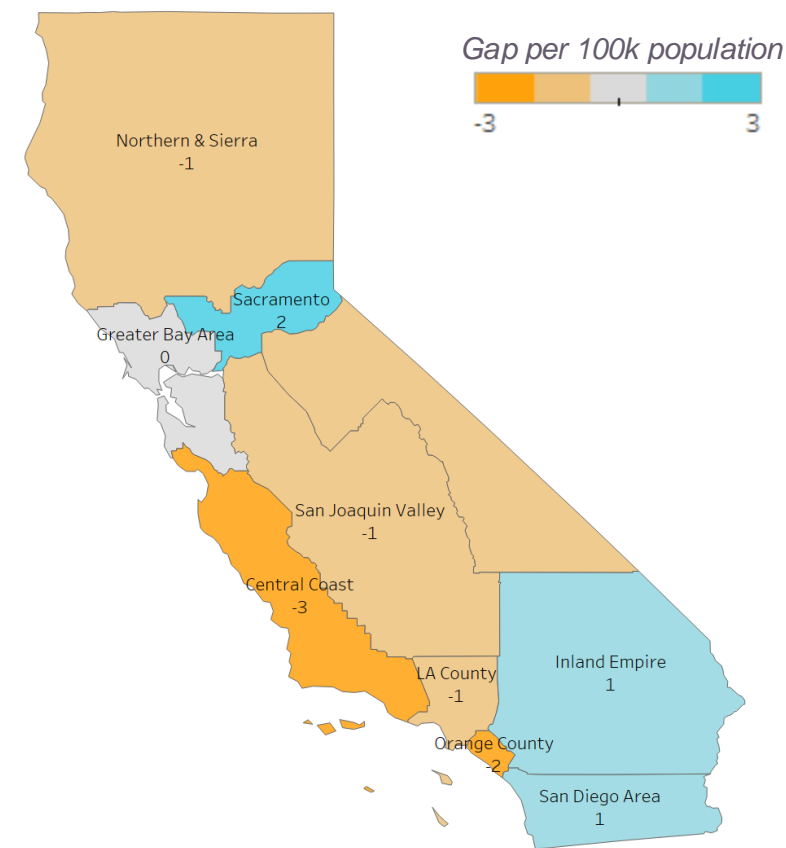
Current state (2022) Nurse anesthetist

Regional model gap relative to pop¹ (shortage, surplus)²



2033 forecast Nurse anesthetist

Regional model gap relative to pop¹ (shortage, surplus)³



1. Per 100k population 2. Min = -3, max = 1. 3. Min = -3, max = 2.

Nurse practitioner (region level)

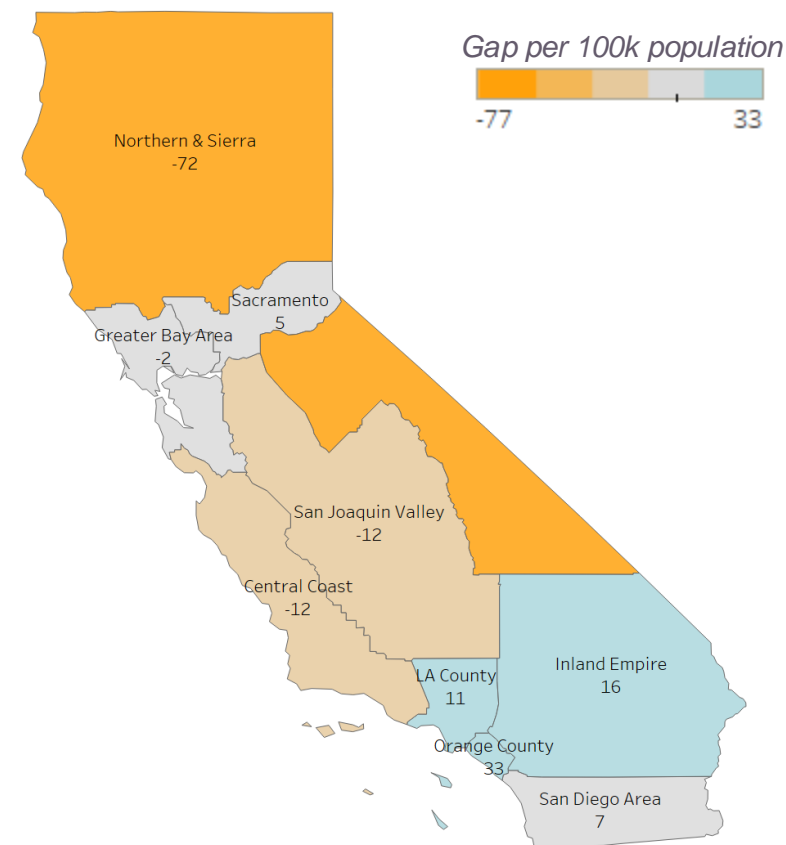
Current state (2022) Nurse practitioner

Regional model gap relative to pop¹ (shortage, surplus)²



2033 forecast Nurse practitioner

Regional model gap relative to pop¹ (shortage, surplus)³

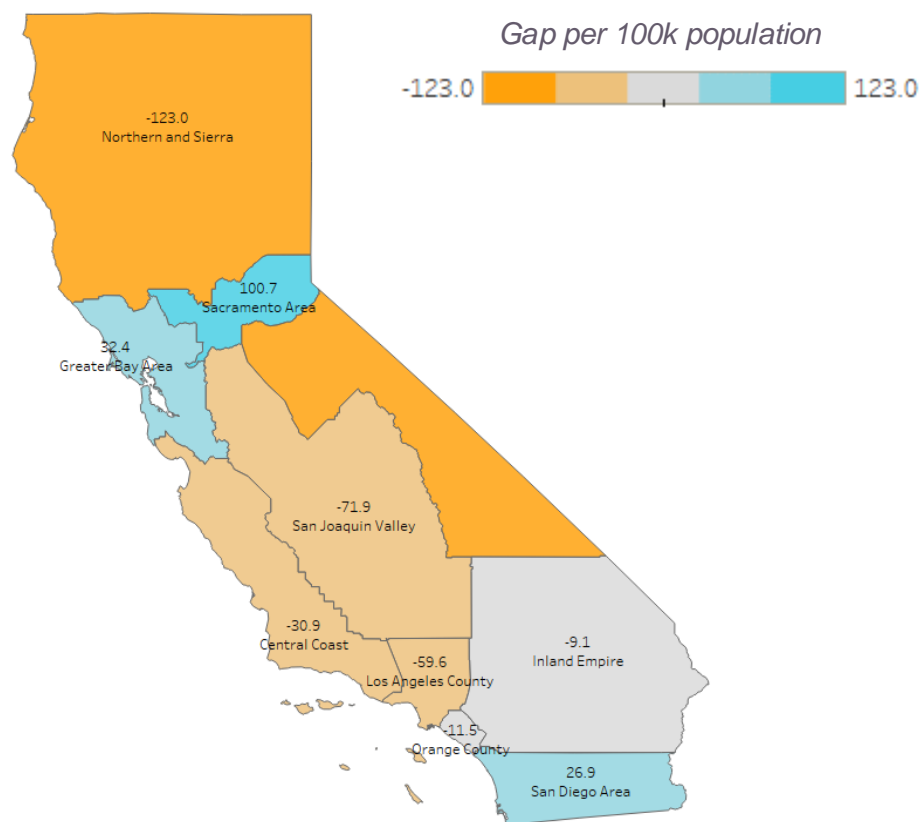


1. Per 100k population 2. Min = -40, max = 34. 3. Min = -72, max = 33.

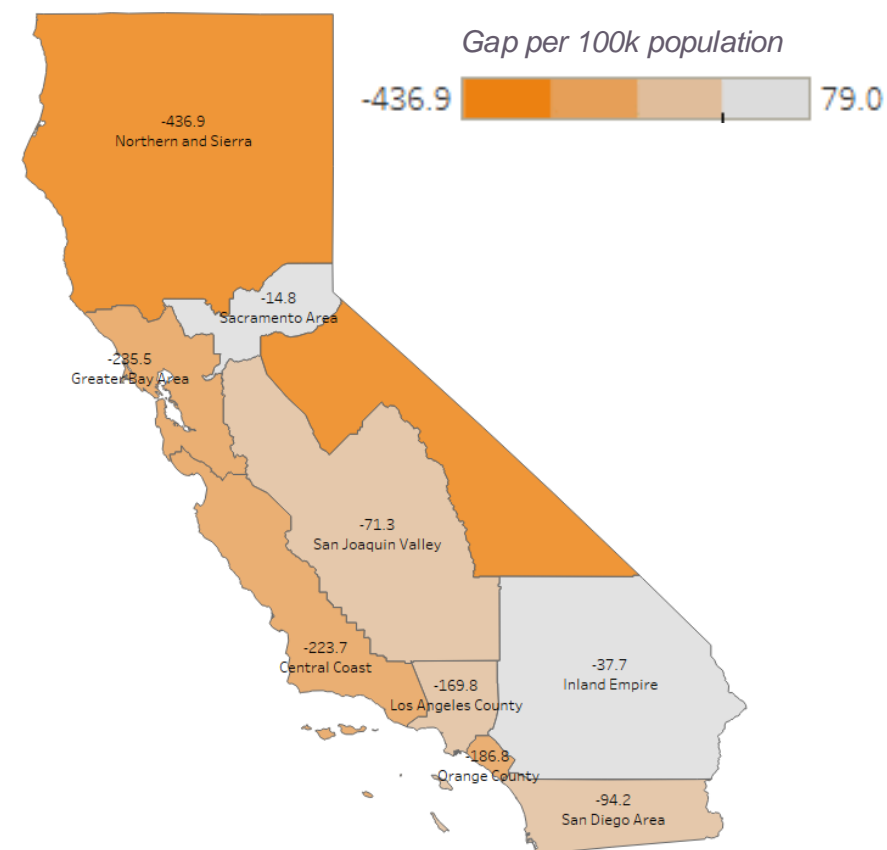
Registered nurse (region level)

Note: RN supply has been adjusted based on commute pattern data from HCAI license renewal survey. Other roles have not yet been adjusted.

Current state (2022) Registered nurse
Regional model gap relative to pop¹ (shortage, surplus)²



2033 forecast Registered nurse
Regional model gap relative to pop¹ (shortage, surplus)³

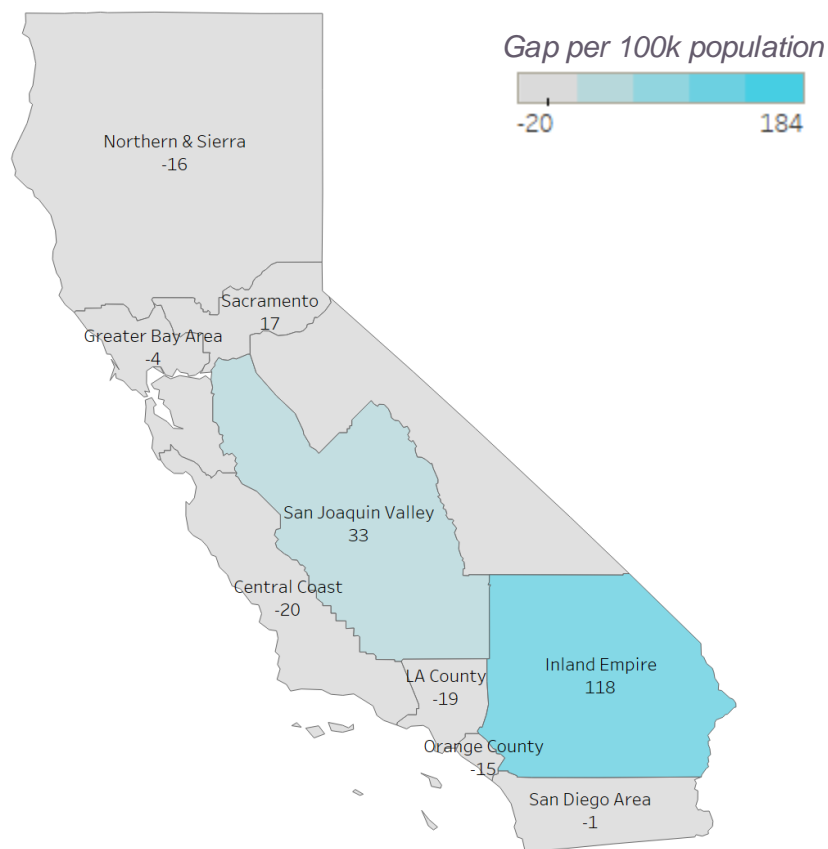


1. Per 100k population 2. Min = -123, max = 123. 3. Min = -437, max = 79.

Vocational nurse (region level)

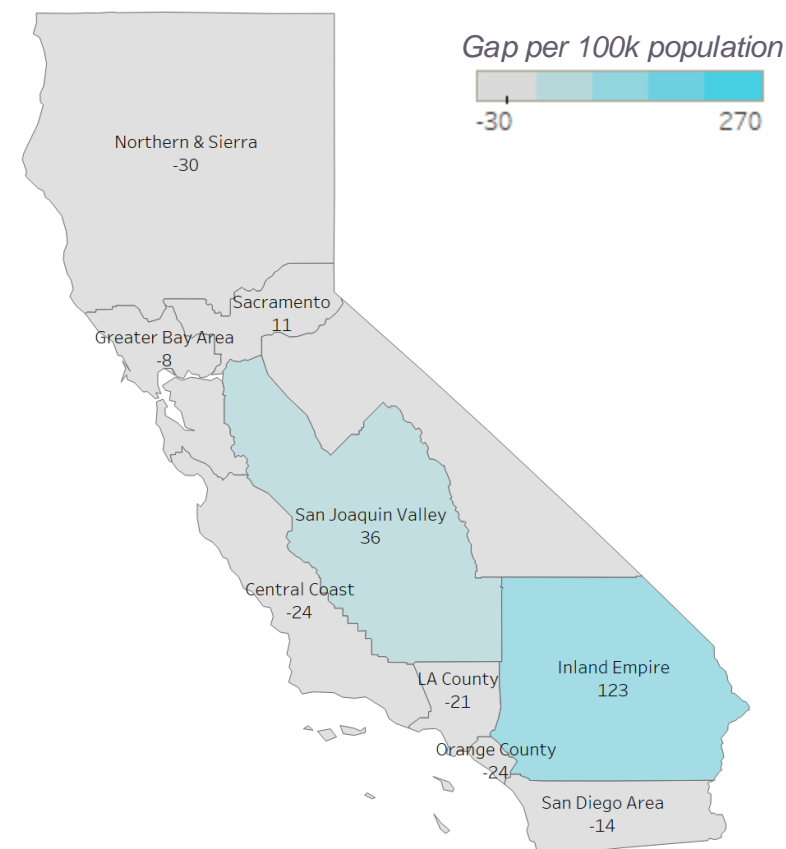
Current state (2022) Vocational nurse

Regional model gap relative to pop¹ (shortage, surplus)²



2033 forecast Vocational nurse

Regional model gap relative to pop¹ (shortage, surplus)³



1. Per 100k population 2. Min = -20, max = 118. 3. Min = -30, max = 123.

Additional role/geo deep-dives – Behavioral Health

Psychiatrists in Northern & Sierra regions

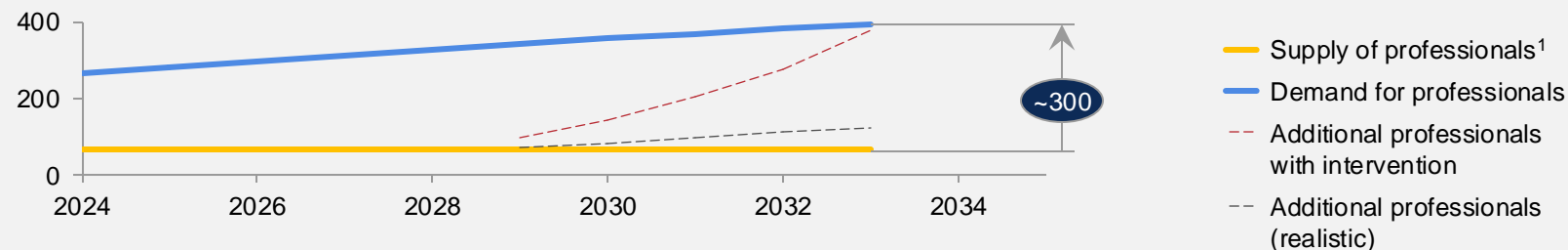
☆ HCAI has, or had, an existing program for intervention

Key professional-to-population disparities:

- **Latine:** ~10% of psychiatrists in Northern & Sierra regions, vs. ~19% of population
- **Spanish-speaking:** ~12% of psychiatrists in Northern & Sierra regions vs. ~14% speaking at home

Forecasted supply and demand

Psychiatrists in Northern & Sierra regions



By 2033, we will need ~300 more Psychiatrists in Northern & Sierra regions to meet forecasted demand



We conducted deep-dives on the following intervention options:

- ☆ **Intervention #1: Expand training capacity** at existing local psychiatry residency program (Healthy Rural California) or fund new residency programs (e.g., Oroville Hospital has become accredited and may be launching a psychiatry residency in 2025, or at sites with other residency specialties and a behavioral health unit, like Adventist Health Ukiah Valley)
 - **Target to close the gap:** Support ~300 additional psychiatry residents over next 9 years
 - **Realistic target:** Support ~50 - 70 additional residents over next 9 years, by growing existing psychiatry residency to 8-10 spots (average residency size in CA), and introducing 1 new psychiatry residency of ~8 spots². Potential to address remaining gap with other professionals such as PMHNPs or BH trained PCPs
- ☆ **Intervention #2:** Maintain existing supply by **retaining those close to retiring and engaging retired professionals** (e.g., incentives like hiring more admin support, providing paid time training new professionals)
 - **Target:** Retain ~4 – 5 retired or near retired psychiatrists per year, over the next 9 years, based on the share of psychiatrists in Northern & Sierra regions reporting expectations to retire within next 5 years³
- ☆ **Intervention #3: Train PCPs** (including MD, DO, NP, and PA) **to integrate BH** into primary care, to reduce demand for psychiatrists and promote multidisciplinary care
 - **Target:** Train ~100 - 300 PCPs over the next 9 years

Additionally, HCAI can increase the supply of psychiatric mental health nurse practitioners (PMHNPs) to offset the gap, given this role's ability to independently practice and prescribe (see *PMHNP deep dive*).

1. Includes pipeline, as projected supply 2. NRMP (2024), "NRMP Program Results 2020-2024 Main Residency Match" 3. HCAI license renewal survey

Summary

Increasing supply and diversity of Psychiatrists in Northern & Sierra regions

Region: Northern & Sierra regions

- Counties with most significant gaps in current state are Sutter, Mendocino, and Tehama

Role(s): Psychiatrists

Time period: Next 9 years

Potential investment required: TBD

Equity: Key disparities include Latine, Black, American Indian, Pacific Islander, Spanish-speaking, Asian & Pacific Island language-speaking

Non-prescribing licensed clinicians – remainder of state

*Sacramento, Inland Empire, LA County, Greater Bay Area, Central Coast, San Diego Area,
Orange County*

We conducted county, provider, and stakeholder interviews to validate that the key shortage drivers were consistent across California

Summary

Increasing supply and diversity of non-prescribing licensed clinicians – remainder of state

Geography: CA statewide

- All regions have shortages in current state, including Sacramento, Inland Empire, LA County, Greater Bay Area, Central Coast, San Diego Area, Orange County (**Northern & Sierra regions and San Joaquin Valley have separate deep-dive**)
- Counties outside Northern & Sierra regions and San Joaquin Valley with most significant gaps in current state are San Benito, El Dorado, Yolo

Role(s): Non-prescribing licensed clinicians

Time period: 9 years

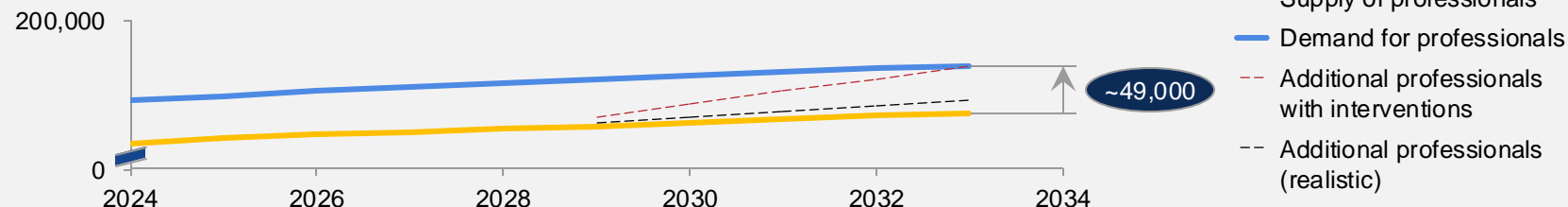
Potential investment required: TBC

Equity: Key disparities include Asian, Black, Latine, American Indian, Pacific Islander, Spanish-speaking, Asian & Pacific Island language-speaking, Other Indo-European language populations

- ☆ HCAI has, or had, an existing program for intervention

Forecasted supply and demand

non-prescribing licensed clinicians in California (Sacramento, Inland Empire, LA County, Greater Bay Area, Central Coast, San Diego Area, Orange County)



By 2033, we will need ~49,000 more non-prescribing licensed clinicians in CA (Sacramento, Inland Empire, LA County, Greater Bay Area, Central Coast, San Diego Area, Orange County) to meet forecasted demand

We conducted deep-dives on the following intervention options:

- ☆ **Intervention #1:** Offer **scholarships** for low-income and underserved students from California to attend relevant graduate programs, prioritizing students who are from and study in California, particularly the Inland Empire, which has one of the fastest growing shortages, as well as those speaking languages with disparities
 - **Target to close the gap:** Support ~49,000 students over the next 9 years
 - **Realistic target:** ~10,000 – 15,000 additional students over the next 9 years, given current number of completions / graduates in San Joaquin Valley and Northern & Sierra regions as well as historical growth rates of completions²
- ☆ **Intervention #2:** Offer **tuition reimbursement and loan repayment** to existing professionals in California to improve retention, prioritizing safety net settings (e.g., Medi-Cal providers, counties)
 - **Target to close the gap:** Support ~100,000 professionals (roughly all existing professionals), each for a 2-year period
 - **Realistic target:** Support ~20,000 – 30,000 professionals, limited to professionals estimated exit supply who also have student loan debt
- ☆ **Intervention #3:** Fund **clinical supervision opportunities** to lower burden of completing supervision (e.g., revenue replacement for employers / sites, stipends for supervisors or students) and lower barriers to expanding program sizes; if possible, prioritize students are from California and settings that serve safety net and complex populations
 - **Target:** Support ~49,000 students / associate professionals over the next 9 years
 - **Realistic target:** ~10,000 – 15,000 additional students over the next 9 years
- ☆ **Intervention #4:** **Expand education capacity**, especially at public institutions (e.g., CCCs, CSUs, UCs), with investments targeted based on representation data (e.g., public schools in low-income areas)
 - **Target to close the gap:** Support ~49,000 additional professionals over the next 9 years
 - **Realistic target:** ~10,000 – 15,000 additional students over the next 9 years, needing 2,000 – 3,000 additional slots, assuming it takes ~4 years to complete graduate education and experience needed to qualify for licensing exam

1. Includes pipeline, as projected supply 2. IPEDS

Psychiatrists – remainder of state

*Sacramento, Inland Empire, LA County, Greater Bay Area, Central Coast,
San Diego Area, Orange County, and San Joaquin Valley*

We conducted county, provider, and stakeholder interviews to validate that the key shortage drivers were consistent across California

Summary

Increasing supply and diversity of Psychiatrists – remainder of state

Geography: CA statewide

- All regions have shortages in current state, including Inland Empire, Central Coast, San Joaquin Valley, Sacramento, Greater Bay Area, San Diego Area, Orange County, LA County (**Northern & Sierra regions has separate deep-dive**)
- Counties outside Northern & Sierra regions with most significant gaps in current state are San Benito, Santa Cruz, El Dorado

Role(s): Psychiatrists

Time period: Next 9 years

Potential investment required: TBD

Equity: Key disparities include Latine, Black, American Indian, Pacific Islander, Spanish language, Asian & Pacific Island language

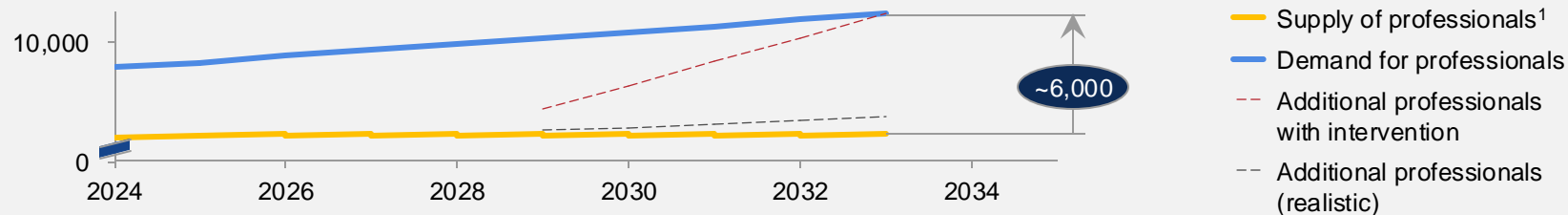
- HCAI has, or had, an existing program for intervention

Key professional-to-population disparities:

- Latine:** ~8% of psychiatrists in remainder of state, vs. ~40% of population
- Spanish-speaking:** ~12% of psychiatrists in remainder of state vs. ~28%

Forecasted supply and demand

Psychiatrists in California (Inland Empire, Central Coast, San Joaquin Valley, Sacramento, Greater Bay Area, San Diego Area, Orange County, LA County)



By 2033, we will need ~6,000 more Psychiatrists in California (Inland Empire, Central Coast, San Joaquin Valley, Sacramento, Greater Bay Area, San Diego Area, OC, LA) to meet forecasted demand



We conducted deep-dives on the following intervention options:

- Intervention #1: Expand training capacity** at the existing 27 psychiatry residency programs or fund new residency programs, potentially in partnership with public employers
 - Target to close the gap:** Support ~6,000 additional psychiatry residents over next 9 years
 - Realistic target:** Support ~400 - 500 additional residents over next 9 years, considering historical growth of psychiatry residents in CA^{2, 3}, through expanding the size of existing residencies and introducing 3 - 5 new residencies (based on the average rate of new CA psychiatry residencies since 2019³). Potential to address remaining gap with other professionals such as PMHNPs or BH-trained PCPs.
- Intervention #2: Maintain existing supply by retaining those close to retiring and engaging retired professionals** (e.g., incentives like hiring more admin, paid time training new professionals)
 - Target:** Retain ~150 – 250 retired or near retired psychiatrists per year, over the next 9 years
- Intervention #3: Train PCPs** (including MD, DO, NP, and PA) to integrate BH into primary care, to reduce demand for psychiatrists and promote multidisciplinary care
 - Target:** Train ~3,000 – 5,000 PCPs over the next 9 years

Additionally, HCAI can increase the supply of psychiatric mental health nurse practitioners (PMHNPs) to offset the gap, given this role's ability to independently practice and prescribe (see PMHNP deep dive).

1. Includes pipeline, as projected supply 2. NRMP (2024), "NRMP Program Results 2020-2024 Main Residency Match" 3. UCSF (2020), "California's Psychiatry Workforce Challenges"

Psychiatric Mental Health Nurse Practitioners statewide

Summary

Increasing supply and diversity of PMHNPs statewide

Region: Statewide

- All regions have a shortage, but the regions with most significant gaps in current state are Central Coast, Northern & Sierra regions, Greater Bay Area

Role(s): PMHNPs

Time period: Next 2 years

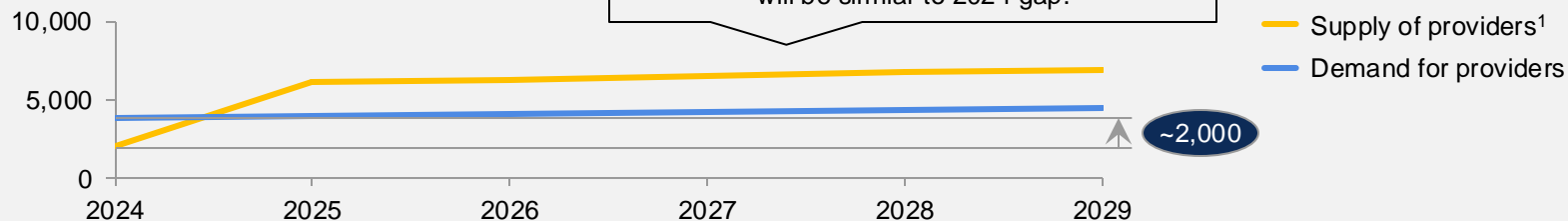
Potential investment required: TBD

Equity: Key disparities could include Latine, American Indian, Pacific Islander, Spanish-speaking, if the population of PMHNPs is similar to overall population of NPs

- HCAI has, or had, an existing program for intervention

Forecasted supply and demand

PMHNPs statewide



By 2029, we will likely need ~1,500 – 2,000 more PMHNPs in California to meet estimated demand



We conducted deep-dives on the following intervention options:

- Intervention #1: Expand training capacity**, particularly for **upskilling** existing NPs (e.g., 1-year postgraduate certificate programs), as well as for highest shortage regions (e.g., Northern & Sierra regions) by prioritizing through scoring sheets
 - Target to close PMHNP gap:** Support ~1,500 – 2,000 additional PMHNP students over next 5 years; NPs forecasted to have statewide surplus of ~2,500 in 2029, so upskilling existing NPs could help close the statewide gap (though NPs also have a shortage in Northern & Sierra regions, which has a significant PMHNP gap)
 - Target to close PMHNP and part of Psychiatrist gap:** Support ~2000 - 3,000 additional PMHNP students over next 5 years, by supporting expansion of PMHNP training and upskilling programs, assuming that ~50% of surplus NPs are upskilled to PMHNPs (~5% of overall NP supply), and considering historical growth rates²

Intervention #2: Fund increased **clinical placement opportunities** for students, prioritizing students at public schools and, if possible, students are from or study in highest shortage regions (e.g., Northern & Sierra regions, Central Coast) through extra points in scoring

- Target to close PMHNP gap:** Support ~1,500 – 2,000 additional PMHNP students over next 5 years
 - Target to close PMHNP and part of Psychiatrist gap:** Support ~2000 - 3,000 additional PMHNP students over next 5 years

Key professional-to-population disparities²:

- ~0.4 representation for Latine NPs across California; ~0.2 for American Indian
- ~0.8 representation for Spanish-speaking NPs across California

1. Includes pipeline, as projected supply 2. IPEDS

Peer Support Specialists statewide

Summary

Increasing supply and diversity of Peer Support Specialists statewide

Region: Statewide

- In current state, all regions have a shortage
- The regions with most significant gaps in current state are Greater Bay Area, Orange County, Central Coast

Role(s): Peer Support Specialist

Time period: 5 years

Potential investment required: TBD

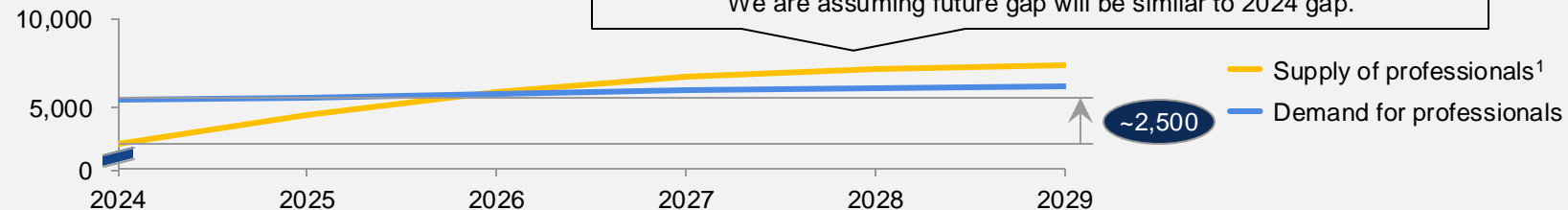
Equity: Key disparities include Asian, Latine, Spanish-speaking, Asian and Pacific Island languages-speaking, Other Indo-European languages-speaking

1. Includes pipeline, as projected supply
 2. CalMHSA

- ☆ HCAI has, or had, an existing program for intervention

Forecasted supply and demand

Peer Support Specialists



Peer support specialists is a relatively new certification, first implemented by CalMHSA in 2022, so limited historical data exists to inform forecasting. In addition, a "speculative / target driven" forecast, similar to that for Certified Wellness Coaches, may be more appropriate. We are assuming future gap will be similar to 2024 gap.

By 2029, we will likely need ~2,500 more Peer Support Specialists in California to meet estimated demand



We conducted deep-dives on the following intervention options:

- ☆ **Intervention #1:** Lower **financial barriers to certification** (e.g., training and certification fees)
 - **Target to close the gap:** Support ~2,500 peer support specialists becoming certified over the next 5 years
- ☆ **Intervention #2:** Fund **peer / mentor networks** for professionals to help increase retention of existing professionals
 - **Target:** Over the next 5 years, support development of peer and mentor networks at the ~10 – 20 highest shortage counties, targeting ~10 – 20 peers per county

Key professional-to-population disparities²:

- **Asian:** 6% of certified peer support specialists; 15% of CA population
- **Latine:** 33% of certified peer support specialists; 40% of CA population

Additional role/geo deep-dives – Nursing

RNs in Los Angeles County

Summary

Increasing supply and diversity of RNs in Los Angeles County

Region: Los Angeles County

- SPA-level results in development

Role(s): Registered Nurses

Time period: 5 years

Potential investment required: TBD

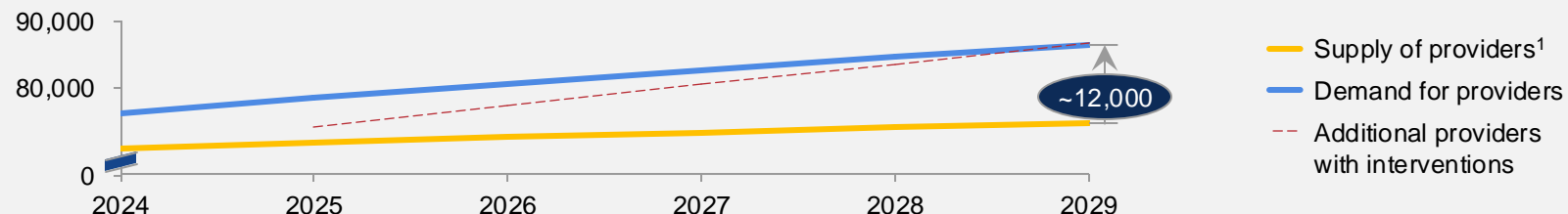
Equity: Key disparities include American Indian, Latine, Black, Spanish-speaking, and Other Indo-European language-speaking

1. Includes pipeline of RNs, as projected supply

- ☆ HCAI has, or had, an existing program for intervention

Forecasted supply and demand

Registered Nurses in Los Angeles County



Key professional-to-population disparities:

- ~0.4 representation for Latine providers in LA;
- ~0.1 for American Indian providers in LA
- ~0.5 representation for Spanish-speaking providers in LA

By 2029, we will need ~12,000 more Registered Nurses in Los Angeles County to meet forecasted demand



We conducted deep-dives on the following eco-system interventions:

- ☆ **Intervention #1:** Offer **tuition reimbursement and loan repayment** to RNs who live and/or work in Los Angeles County, prioritizing those serving in safety net settings (e.g., Medi-Cal, FQHC)
 - **Target:** Support ~60k RNs, retain all existing providers
 - **Realistic target:** Support ~12k providers, limited to providers estimated exit supply who also have student loan debt, and not exceeding forecasted gap
- Intervention #2:** Fund **peer and mentor networks** for RNs who work in Los Angeles County, prioritizing those serving in safety net settings (e.g., Medi-Cal, FQHC)
 - **Target:** Grant ~10 – 20 employers per year to develop peer and mentor networks, targeting participation of 50 - 100 nurses per employer; each employer gets 3 years of funding
- Intervention #3:** **Engage and retain retired nurses** or those close to retiring who live and/or work in Los Angeles County (e.g., incentives like hiring more admin, paid time training new providers)
 - **Target:** Retain ~1000 - 2000 retired or close-to-retiring nurses per year, based on anticipated RN retirement rates in LA county², each nurse retained for 3 years
- ☆ **Intervention #4:** **Expand education capacity**, particularly at public institutions (e.g., CCCs, CSUs, UCs), including ADN, BSN, concurrent enrollment
 - **Target:** Support ~10 – 15k additional students over next 5 years, needing ~1-2k ADN slots and ~5-10k BSN slots, based on current proportions of ADN vs BSN in LA (however, preference should be given to ADN to quickly produce a diverse workforce)³

For discussion: What players, funders, and partners would need to be engaged in each intervention?

1. Includes pipeline, as projected supply 2. HCAI license renewal survey 3. HCAI CA Health Workforce Education Pathways dashboard

Nurse Practitioners in Northern and Sierra regions

Summary

Increasing supply and diversity of NPs in Northern & Sierra regions

Region: Northern & Sierra regions

- Counties with most significant gaps in current state are Sierra, Modoc, Plumas

Role(s): Nurse Practitioners

Time period: 5 years

Potential investment required: TBD

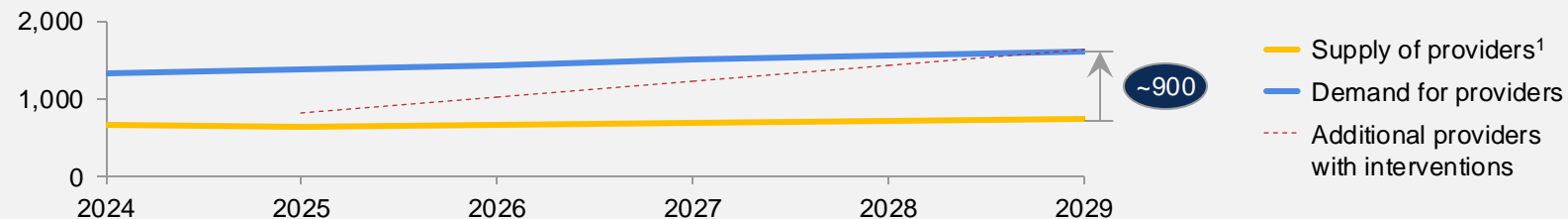
Equity: Key disparities include Pacific Islander, American Indian, Latine, Black, Asian & Pacific Island language-speaking

1. Includes pipeline as projected supply

- ☆ HCAI has, or had, an existing program for intervention

Forecasted supply and demand

Nurse Practitioners in Northern & Sierra regions



By 2029, we will need ~900 more Nurse Practitioners in Northern & Sierra regions to meet forecasted demand



We conducted deep-dives on the following eco-system interventions:

- ☆ **Intervention #1:** Provide **incentives to redistribute** existing workforce from surplus regions to Northern & Sierra regions
 - Target:** Support ~900 - 1000 providers relocating over 5 years from surplus regions (e.g., Sacramento), assuming 90-95% remain until 2029 since intervention paired with long-term incentives, to close gap of ~900
- ☆ **Intervention #2:** Provide financial **incentives for providers to stay long term** (>5 years) in underserved areas like Northern & Sierra regions
 - Target:** Support ~900 - 1000 providers from surplus regions to stay long term in Northern & Sierra regions (>5 years), assuming 90-95% remain until 2029, to close gap of ~900

Education capacity expansion not prioritized for this role and region combination as NP forecasted to have statewide surplus across all years shown in the model (though surplus narrows over time)

For discussion: What players, funders, and partners would need to be engaged in each intervention?

Key professional-to-population disparities:

- ~0.3 representation for American Indian providers in Northern & Sierra regions; ~0.4 for Latine
- ~0.6 representation for Asian & Pacific Island language-speaking in Northern & Sierra regions

Licensed Vocational Nurses statewide
*Central Coast, LA County, Northern & Sierra regions,
Orange County, Greater Bay Area, San Diego Area*

Summary

Addressing maldistribution and diversity of LVNs across California

Geography: CA statewide

- Regions with shortages in current state are Central Coast, LA County, Northern & Sierra regions, Orange County, Greater Bay Area, San Diego Area
- Counties with most significant gaps in current state are Colusa, Marin, Plumas

Role(s): Licensed Vocational Nurses

Time period: 5 years

Potential investment required: TBD

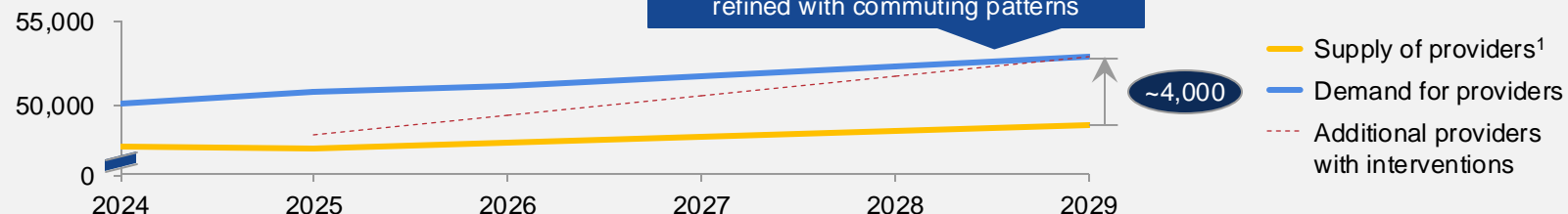
Equity: Key disparities include American Indian, Latine, Spanish-speaking, Other Indo-European Language-speaking

1. Includes pipeline as projected supply

- ☆ HCAI has, or had, an existing program for intervention

Forecasted supply and demand

Licensed Vocational Nurses in Central Coast, LA County, Northern & Sierra regions, Orange County, Greater Bay Area, San Diego Area



By 2029, we will need ~4,000 more LVNs in CA shortage regions (Central Coast, LA County, Northern & Sierra regions, Orange County, Greater Bay Area, San Diego Area) to meet forecasted demand



We conducted deep-dives on the following eco-system interventions:

- ☆ **Intervention #1:** Provide **incentives to redistribute** existing workforce from surplus regions (e.g., Inland Empire) to shortage regions (e.g., Central Coast)
 - Target:** Support ~4000 - 4500 providers relocating over 5 years from surplus regions (e.g., Sacramento), assuming 90-95% remain until 2029 since intervention paired with long-term incentives, to close gap of ~4000
- Intervention #2:** Provide financial **incentives for providers to stay long term** (>5 years) in shortage areas (e.g., Central Coast)
 - Target:** Support ~4000 - 4500 providers from surplus regions to stay long term in shortage regions (~5 years), assuming 90-95% of relocated LVNs remain until 2029

Education capacity expansion not prioritized for this role and region combination as LVN forecasted to have statewide surplus across all years shown in the model (though surplus narrows over time)

For discussion: What players, funders, and partners would need to be engaged in each intervention?

