New ESRD PPS Wage Index Construction Methodology Proposed in the CY 2025 ESRD PPS Proposed Rule

Data Sources

Principal Data Sources

- Data from Form CMS 265-11: Cost Report for Freestanding Dialysis Facilities (2021 - 2022)[1] – Accessed 3/4/2024
- Bureau of Labor Statistics (BLS) Occupational Employment and Wage Survey (OEWS) (May 2022)[2] – Accessed 12/1/2023

Additional Data Sources

- CY 2025 ESRD PPS Legacy Wage Index[3] (Addendum B)
- County-CBSA Crosswalk (Addendum A)
- U.S. Census Bureau Annual Resident Population Estimates for States and Counties: April 1, 2020 to July 1, 2022 (2022)[4] – Accessed 3/6/2024
- Connecticut census tract crosswalk to town, county, county equivalent, and ZIP code (2022)[5] – Accessed 12/1/2023
- Characteristics of Dialysis Facilities with ESRD PPS-Eligible Outpatient 72x Claims (2021-2023) – Accessed 2/26/2024
- ZIP9 zip code – FIPS county code crosswalk (2023)[6] – Accessed 1/4/2024

Methodology Overview

This section provides a high-level overview of the more detailed steps provided in the 'Construction Steps' section. Black bullets denote main steps in the wage index construction process, and the white bullets denote key calculations or sub-steps that underly each main step. Please see section II.B.2 of the CY 2025 ESRD PPS NPRM for a more in-depth discussion of the steps involved in constructing the wage index.

- Obtain wage data from publicly available BLS OEWS
  - County-level wages for each relevant occupation.[7]
- Obtain data from freestanding facility cost reports
  - National average full-time equivalents (FTEs) for each relevant occupation

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[1] https://www.cms.gov/data-research/statistics-trends-and-reports/cost-reports/renal-facility-265-2011-form

[2] BLS Wage data: https://www.bls.gov/oes/special-requests/oesm22all.zip
   BLS Area Definitions: https://www.bls.gov/oes/2022/may/area_definitions_m2022.xlsx

[3] The ESRD PPS legacy wage index methodology uses the pre-reclassification, pre-floor IPPS wage index with the ESRD PPS wage index floor of 0.6000.

[4] https://www2.census.gov/programs-surveys/popest/datasets/2020-2022/counties/totals/co-est2022-alldata.csv

[5] https://github.com/CT-Data-Collaborative/2022-tract-crosswalk

[6] https://www.zip-codes.com/

[7] Occupations chosen correspond to those on freestanding facility cost reports: Registered Nurses, Licensed Practical Nurses, Nurses' Aides, Technicians, Social Workers, Dieticians, Administrative Staff, and Management. See Appendix for Crosswalk of Occupation Codes on ESRD Cost Reports and BLS Data. For the remainder of this document, all references to occupations refer to those chosen above.

- o Treatment counts for each county
- Calculate CBSA-level average wages for each occupation
  - o Map each CBSA to the relevant counties to get the relevant wages and treatment counts
  - o CBSA-level average wages are weighted by county treatment counts
- Calculate average wages across occupations for each CBSA
  - o Using occupation-specific CBSA-level average wages, weighted by occupation-specific national average FTEs
- Calculate the national average wage across occupations
  - o National average wage by occupation: Using CBSA-occupation average wages, weighted by CBSA treatment counts
  - o National average wage across occupations: Using national average wage by occupation, weighted by occupation national average FTEs
- Calculate the raw wage index for each CBSA
  - o Divide CBSA-level average wage by the national average wage
- Calculate recalibrated wage index for each CBSA
  - o Multiply each raw wage index by CBSA treatment weighted average of the ESRD PPS legacy wage indices, divided by the treatment weighted national average raw wage index
    - ▪ Done to ensure the weighted average of BLS-based wage indices is the same as the weighted average of the legacy wage indices
  - o Apply 0.6 wage index floor

Construction Steps

Step 1 – Obtain facility-level treatment counts and national average full-time equivalents (FTEs) for each occupation

a. Use 2022 and 2021 freestanding facility cost reports to calculate total facility-level treatment counts and the average FTEs per thousand treatments[8] for the following eight occupations: Registered Nurses, Licensed Practical Nurses, Nurses' Aides, Technicians, Social Workers, Dieticians, Administrative Staff, and Management.[9]

   a.1. The calculations are based on freestanding facility cost reports only, since hospital-based dialysis facilities do not report administrative and management staff effort in their cost reports.

   a.2. Facility data from the 2021 cost report are used only when 2022 cost report data are not available.

   a.3. If total treatment counts are not reported, Medicare treatment counts are used. 2022 Medicare treatment counts are prioritized over 2021 Medicare treatment counts when available.

   a.4. Facilities with zero treatment counts are excluded.

b. Calculate the national average FTEs for each occupation, weighted by facility total treatment counts. This is the National ESRD Facility Occupational Mix (NEFOM) and these averages will be used in Step 5.

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[8] "FTEs" refers to FTEs per thousand treatments in the rest of the document.
[9] See Appendix for the BLS Occupation Title and Code for each of these occupations.

Step 2 – Calculate county-level total treatment counts

a. Assign FIPS county code to dialysis facilities identified in Step 1.
   a.1. For facilities with eligible 72x claims in the current rulemaking cycle[10], assign them the most recent FIPS county code identified in the rulemaking process.
   a.2. For facilities without eligible 72x claims in the current rulemaking cycle, obtain their most recently available zip code from cost reports, and map their zip codes to corresponding FIPS county codes based on the 2023 ZIP9 zip code – FIPS county code crosswalk.
      a.2.1.For facilities in Connecticut without eligible 72x claims in the current rulemaking cycle, crosswalk their FIPS county codes to corresponding planning region codes.[11]
   a.3. Check that the FIPS county codes assigned to each facility is consistent with the 2025 county codes (Addendum A).
      a.3.1.For FIPS codes not identified in the county-CBSA crosswalk, replace the county code (the last 3 digits of the 5-digit FIPS code) with "000" (represents unknown counties).[12]

b. Aggregate the provider-level total treatment counts calculated in Step 1 to the county/planning region level. Include counties with 0 treatment counts in the output.

Step 3 – Calculate county-level wages for each occupation

a. Map counties to metropolitan areas, non-metropolitan areas, and New England city and town areas (NECTAs, applicable in CT, NH, MA, ME, RI and VT) based on the 2022 BLS area definitions.

b. Use the mean hourly wage in 2022 BLS OEWS wage data for metropolitan areas, non-metropolitan areas, and NECTAs to determine county-level wages for relevant occupations.
   b.1. For counties in metropolitan and non-metropolitan areas in non-New England states, use their respective metropolitan area/non-metropolitan area wages.
   b.2. Since individual counties in New England states can be covered simultaneously by metropolitan areas, non-metropolitan areas, and NECTAs, wages of a New England county are calculated using a straight average of wages from all metropolitan areas, non-metropolitan areas, and NECTAs covering this county.
      b.2.1.   To further calculate wages for CT planning regions, take the straight average of wages of all CT counties that the planning region is associated with.
   b.3. For Guam and Virgin Islands, take the wages for the whole territory since BLS wages are estimated at the territory level.

c. Merge county-level wages from Step 3.b and county-level treatment counts from Step 2 with the county-CBSA crosswalk.[13]

d. Impute county-level missing wages for a given occupation[14] using the following ordered rules:
   d.1. Impute missing wages for Dietitians, Technicians, and Nurses' Aides. Through investigating county-level wage correlations among occupations using the following model, statistically

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[10] For the CY 2025 ESRD PPS NPRM, facilities with eligible 72x claims are those with any ESRD PPS-eligible 72x claims in CY2021 – CY2023.

[11] This is done due to the update of CBSA delineations in 2025, where CBSAs in Connecticut are composed of planning regions instead of counties.

[12] The only FIPS codes that are not identified in our list were from the following territories of the U.S.: American Samoa, Northern Marina Islands, and Virgin Islands.

[13] CBSA crosswalk in Addendum A for CY 2025 is based on the most recent OMB CBSA delineations available at: https://www.whitehouse.gov/wp-content/uploads/2023/07/OMB-Bulletin-23-01.pdf

[14] Among the 25,808 unique county-occupation combinations, the wage information missing rate is 5.2%.

significant and practically meaningful correlations are identified across each of the following pairs of occupations: (1) A. Dietitians and B. Registered Nurses, (2) A. Technicians and B. Licensed Practical Nurses, and (3) A. Nurses' Aides and B. Administrative Staff:

$$Wage_{OccupationA} = \alpha + \beta(Wage_{OccupationB}) + \gamma ln(County\ Treatments) + \delta(Rural\ County\ Flag) + \theta(Census\ Region\ Dummies) + \varepsilon$$

Where:
- A log transformation was performed on county treatments to make it normally distributed. Note that since ln (x) is defined for where x is greater than 0, for x equal to 0, set the parameter (i.e., ln (x)) to 0.
- The rural county flag is defined in the 2025 county-to-CBSA crosswalk. It consists of two categories: Rural and Urban, with the "Rural" category being used as the reference category in the model.
- The four U.S. Census Bureau Regions are used here (i.e., Northeast, Midwest, South, West). "Northeast" was used as the reference category in the model.

Therefore, at the county level:
- d.1.1. Use the wage of Registered Nurses and the model to predict and impute the wage of Dietitians
- d.1.2. Use the wage of Licensed Practical Nurses and the model to predict and impute the wage of Technicians
- d.1.3. Use the wage of Administrative Staff and the model to predict and impute the wage of Nurses' Aides
- d.2. If d.1 is not available, impute missing wages using treatment weighted CBSA-level average wages for the occupation.
- d.3. If d.2 is not available, impute missing wages using treatment weighted state-level rural or urban average wages for the occupation, depending on the rural/urban status of the county.
- d.4. If d.3 is not available, impute missing wages using BLS state-level wage * national-level rural or urban wage ratio for the occupation, depending on the rural/urban status of the county.
    - d.4.1. national-level rural wage ratio = treatment weighted national-level rural average wage / treatment weighted national-level average wage
    - d.4.2. national-level urban wage ratio = treatment weighted national-level urban average wage / treatment weighted national-level average wage
- d.5. If d.4 is not available, impute missing wages using BLS national-level wage * national-level rural or urban wage ratio for the occupation, depending on the rural/urban status of the county.

Step 4 – Calculate CBSA-level average wages for each occupation

a. Calculate average wages for each CBSA-occupation combination by weighting county-occupation wages in Step 3 by county treatment counts in Step 2.
- a.1. For CBSAs with zero treatment counts and therefore without treatment weighted average wages, take the 2022 county population weighted average of wages of all counties in the CBSA as the CBSA's average wage for the occupation.

b. Keep the CBSA-level treatment counts used in step 4a to find the average wages. This will be used in step 6.

Step 5 – Calculate average wages across occupations for each CBSA

a. Calculate CBSA-level average wages by weighting wages in Step 4 by national average FTEs weights from the NEFOM calculated in Step 1.

Step 6 – Calculate the average wage across occupations at the national level

a. Calculate the national average wage for each occupation as the CBSA treatment-weighted average of CBSA-level average wages for that occupation.
b. Calculate the national average wage as the national average FTEs (from the NEFOM) weighted average of the wages in Step 6a.

Step 7 – Calculate the raw wage index for each CBSA

a. Divide the CBSA average wages calculated in Step 5 by the national average wage calculated in Step 6 to get the raw CBSA-level wage indices.

Step 8 – Calculate the recalibrated wage index for each CBSA

a. Calculate the CBSA treatment weighted national average of the CY 2025 ESRD PPS legacy wage index.
b. Calculate the CBSA treatment weighted national average of the raw BLS wage index.
c. Multiply the raw wage indices calculated in Step 7 by the national average of legacy wage index in Step 8a, divided by the national average raw BLS wage index calculated in Step 8b, to get the final BLS wage indices.
  c.1. Note in this case, the average computed from Step 8b equals 1.
d. For CBSAs with a wage index smaller than 0.6, apply the 0.6 wage floor.

Appendix

Table 1 provides a crosswalk of occupations on ESRD cost reports to their BLS occupation titles and occupation codes.

Table 1: Crosswalk of Occupation Codes on ESRD Cost Reports and BLS Data

ESRD PPS Colloquial Name	BLS Occupation Title	Occupation Code
Registered Nurses (RN)	Registered Nurses	29-1141
Licensed Practical Nurses (LPN)	Licensed Practical and Licensed Vocational Nurses	29-2061
Nurse Aides	Nursing Assistants	31-1131
Technicians	Health Technologists and Technicians, All Other	29-2099
Social Workers	Healthcare Social Workers	21-1022
Dieticians	Dieticians and Nutritionists	29-1031
Administrative Staff	Medical Secretaries and Administrative Assistants	43-6013
Management	Medical and Health Services Managers	11-9111