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Informing the Design of Career Pathway Programs Using Data on Occupational Transitions in the Wider Labor Market

Preliminary Insights from the Descriptive and Analytical Career Pathways Study for the U.S. Department of Labor

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Study Overview



- Analysis of career trajectories
- Research questions:
 - How do workers progress on their own through education and training and associated jobs?
 - To what extent are the occupations targeted by career pathways programs associated with favorable occupational transitions (in terms of wage growth) in the economy at large?
 - What are the implications for the design and practice of career pathways efforts?

Labor Market Transitions as Context for Career Pathway Programs



- Transitions in the labor market more generally provide important context for career pathway programs, such as:
 - Many observed transitions are lateral or downward
 - Upward transitions may be harder to make
 - Most transitions are within a given occupational cluster
 - Hard to move out of an occupational cluster without retraining
 - Results of general labor market analysis can inform feasibility of transitions planned by career pathway programs

Career Trajectories Analysis Approach



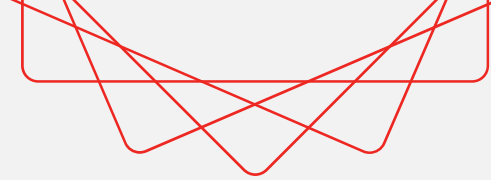
1. Using various data sources, build a matrix of occupational transitions that reflects what exists in the U.S. labor market at large
2. Characterize the frequency and nature of these transitions, and compare them with the transitions frequently targeted by career pathway programs
3. Identify lessons for the design of career pathways programs

Data Sources



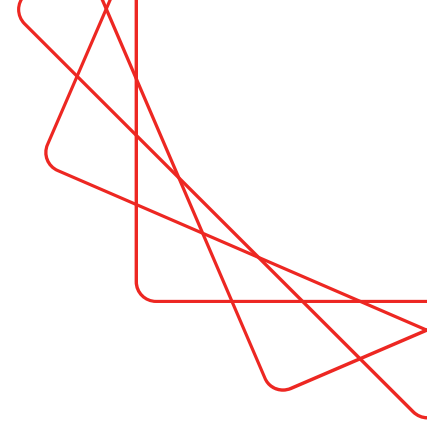
- Current analysis uses:
 - Current Population Survey Outgoing Rotation Group (CPS ORG), data from 2013 and 2014
- Future work will also use:
 - National Longitudinal Survey of Youth (NLSY, 1997)
 - Worker Profile Data (from a vendor)

Data Source



- Current Population Survey Outgoing Rotation Group (CPS ORG), data from 2013 and 2014
 - Monthly survey of about 60,000 households
 - ORG consists of those in their 4th or 8th month of participation (same month in consecutive years)
 - One-year longitudinal component
 - Offers representative sample of the general population
 - Has limited coverage of less common occupations

Preliminary Insights



Findings in Brief



- Most workers stay in the same occupation over that one-year period
 - Retention varies between occupations
- Despite relatively high retention rates, substantial numbers of workers transition between occupations
- Common occupations act as “attractors;” more workers transition to them because they have more openings
- In the labor market, workers have constrained options for occupational transitions
- Targeted transitions for career pathways can be categorized according to the likelihood of making the transition, and potential for wage growth
 - The number and nature of promising transitions varies considerably by occupation

Transition vs. Transition Types



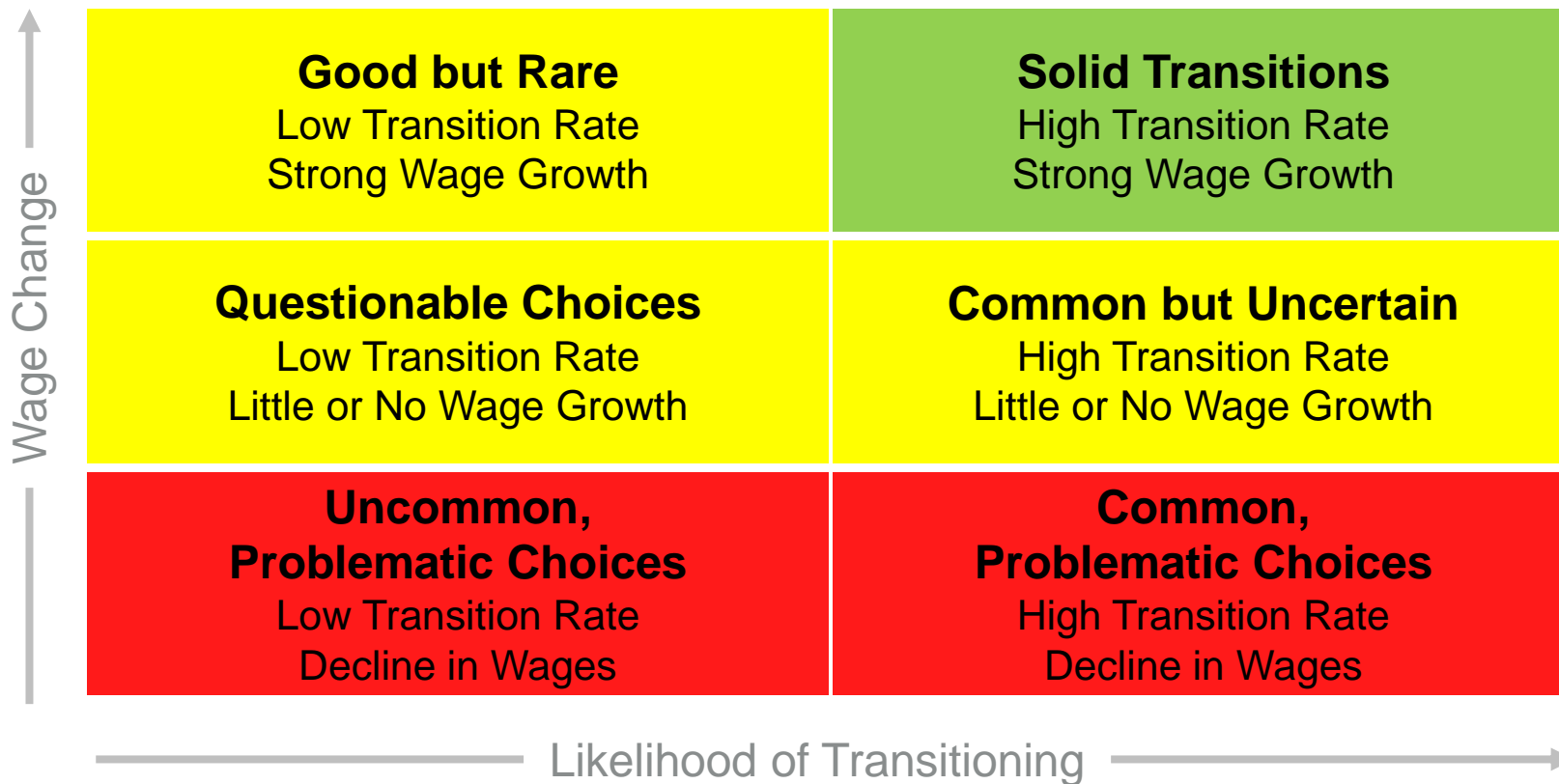
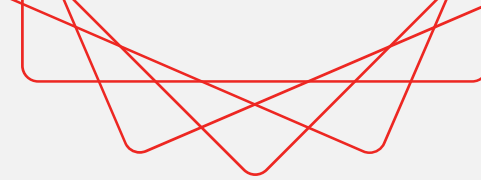
- A transition involves an individual worker
- A transition type refers to all the worker transitions of a particular type, that is, between a particular occupation A and a second occupation B

Observed Transition Types



- 480 distinct occupations in the CPS ORG
- 230,000 theoretically possible transition types between occupations
 - 12,000 transition types (~5%) of these are observed
 - ~95% of possible transition types are not observed
 - This is a partially a function of the one-year period examined and the size of the data set
 - But some transitions are bound to be negligible in probability no matter what the size of the dataset, such as from highly skilled professions to unskilled jobs

Implications of Transition Types for Career Pathways Programs

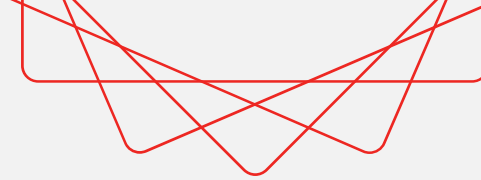


Starting as a Personal Care Aide



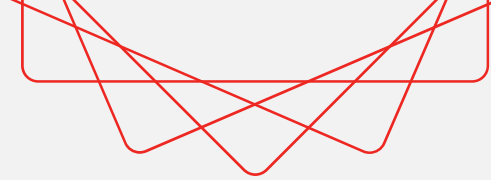
	Destination Occupation	Share	Cumulative Share
1	Nursing, psychiatric, and home health aides	39%	39%
2	Childcare workers	4%	43%
3	Licensed practical and licensed vocational nurses	4%	47%
4	Maids and housekeeping cleaners	3%	50%
5	Retail salespersons	2%	52%
6	Registered nurses	2%	53%
7	Teacher assistants	2%	55%
8	Social workers	2%	57%
9	Counselors	2%	58%
10	Secretaries and administrative assistants	2%	60%

Starting as a Computer Support Specialist



	Destination Occupation	Share	Cumulative Share
1	Computer occupations, all other	19%	19%
2	Computer, automated teller, and office machine repairers	8%	27%
3	Network and computer systems administrators	7%	34%
4	Computer and information systems managers	5%	39%
5	Customer service representatives	5%	44%
6	Computer systems analysts	5%	48%
7	Computer programmers	4%	52%
8	Software developers, applications and systems software	4%	56%
9	Managers, all other	3%	59%
10	Business operations specialists, all other	3%	62%

Starting as a Secondary School Teacher



	Destination Occupation	Share	Cumulative Share
1	Elementary and middle school teachers	66%	66%
2	Education administrators	3%	69%
3	Special education teachers	3%	72%
4	Other teachers and instructors	3%	74%
5	Postsecondary teachers	2%	77%
6	Counselors	2%	78%
7	Teacher assistants	2%	80%
8	Other education, training, and library workers	1%	81%
9	Preschool and kindergarten teachers	1%	82%
10	First-line supervisors of retail sales workers	1%	83%

Common Occupations of Possible Interest to Career Pathway Programs



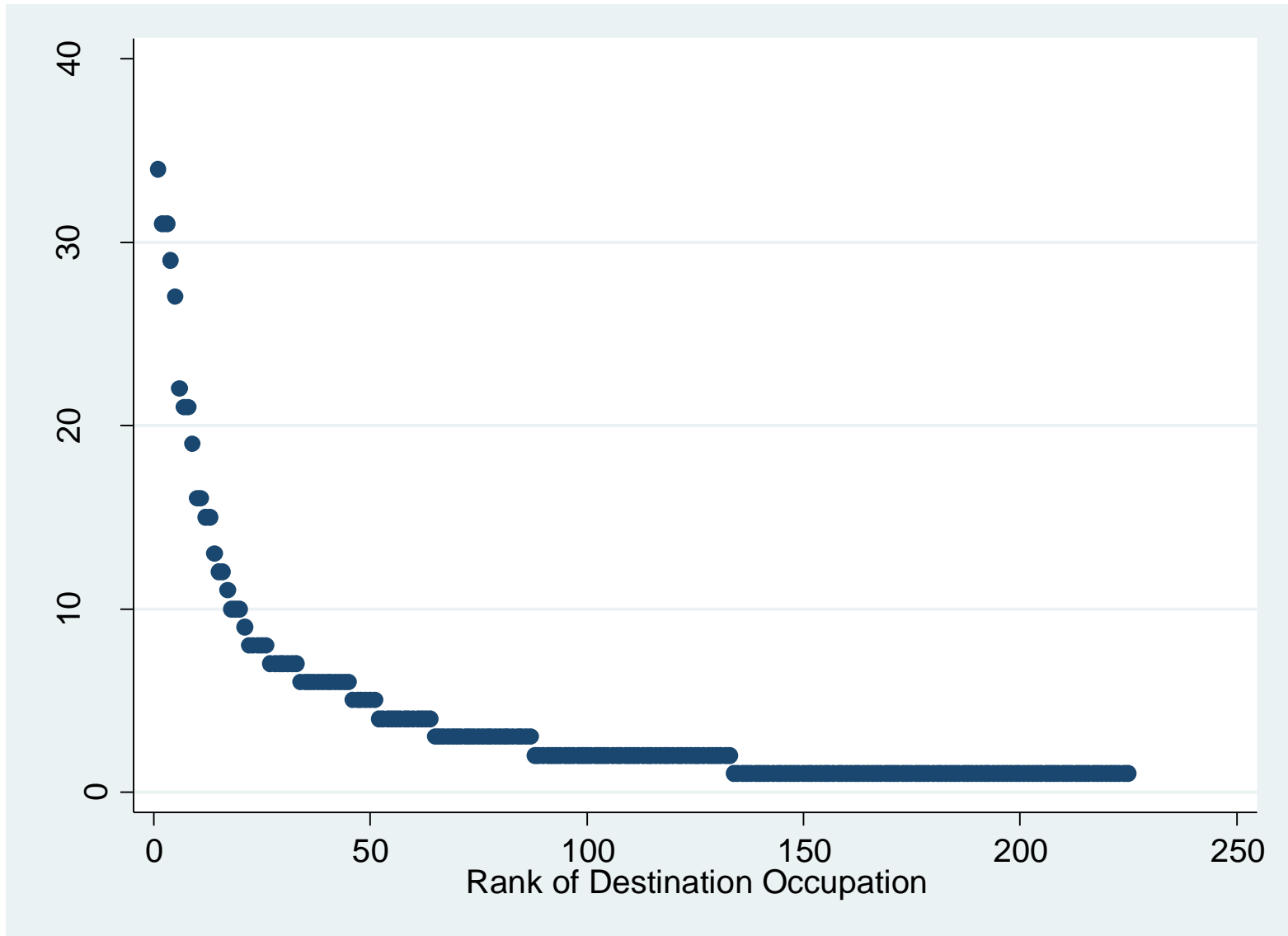
	High Retention (Highest First)	Low Retention (Lowest First)
1	Registered Nurses	Maintenance and Repair workers, General
2	Dental Assistants	Computer, Automated Teller, and Office Machine Repairers
3	Paralegals and Legal Assistants	Office Clerks, General
4	Diagnostic-Related Technologists and Technicians	Production Workers, All Other
5	Health Practitioner Support Technologists	First-Line Supervisors of Housekeeping and Janitorial Workers
6	Occupational Therapists	Computer Support Specialists
7	Respiratory Therapists	Food Preparation Workers
8	Roofers	First-line Supervisors of Office and Administrative Support Workers
9	Electricians	First-line Supervisors of Non-Retail Sales Workers
10	Welding, Soldering, and Brazing Workers	Laborers and Freight, Stock, and Material Movers, Hand

Transitions are Uneven

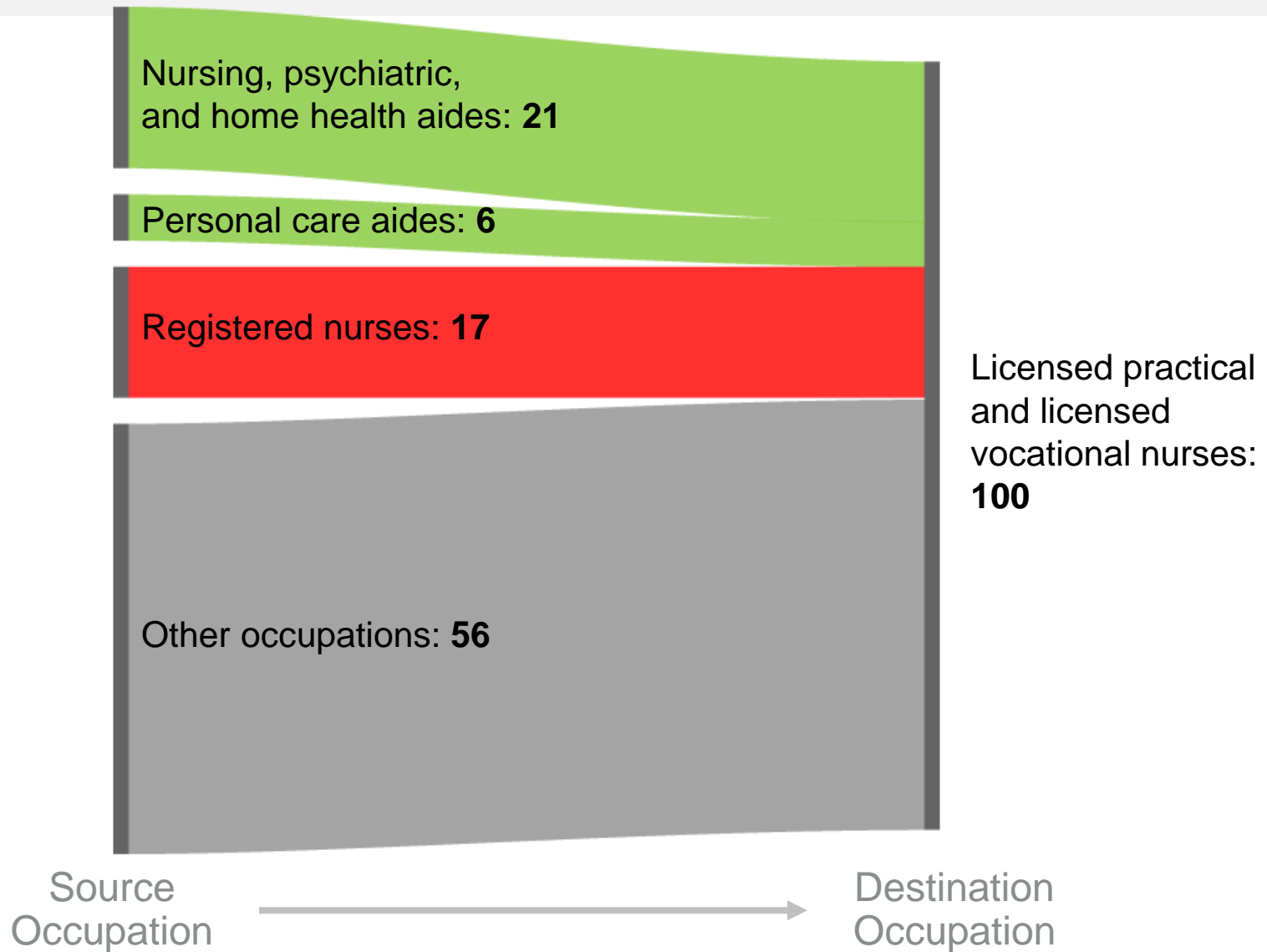


- From a given starting occupation...
 - Relatively few destination occupations account for most of the flow out of it
- To a given destination occupation...
 - Relatively few source occupations account for most of the flow into it
- A “power law” (Zipf’s Law) governs the relative rates of flow:
 - the flow decreases at an exponential rate between each occupation and the one with the next highest flow; in other words, flow is related to each occupation’s rank in the list
 - R-squared associated with the fit of a power law to the data of the source occupation shown is about 85%

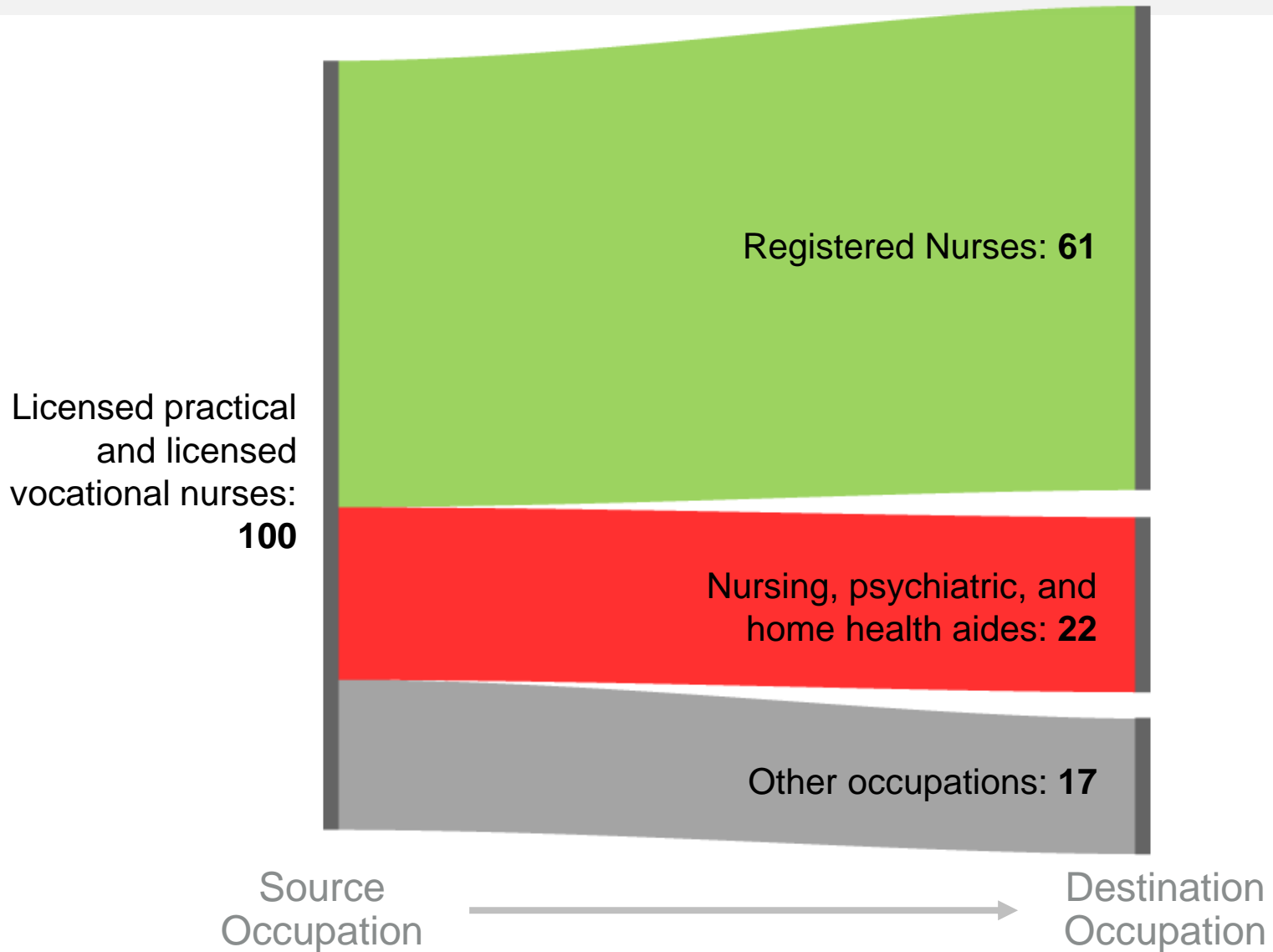
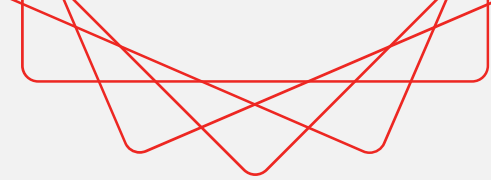
Frequency of Destination Occupations from a Single Source Occupation



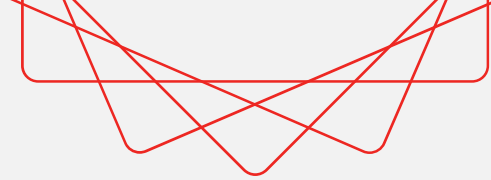
Data Visualization



Data Visualization (cont.)



Modeling the Transition Process

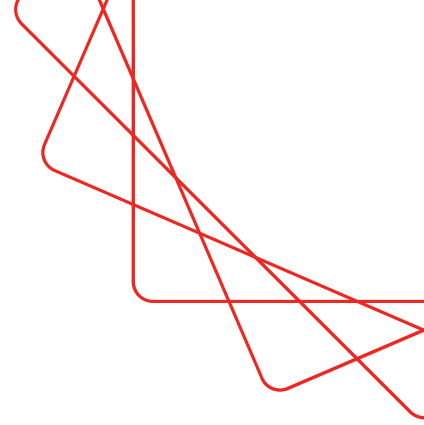


- Initial models using the CPS ORG show that workers tend to transition to occupations that:
 - Have more openings
 - Are in the same occupational cluster and/or industry as the occupation they are coming from (e.g., health care occupations, education occupations)
 - Are at a similar education, skill, and wage level
 - Are similar in terms of demographics: age, gender, racial and ethnic composition, and metro/rural status
- This puts strong constraints on workers, which career pathway programs labor to overcome

Discussion & Implications



- **Constrained Options for Workers**
 - In the labor market, workers have constrained options for occupational transitions
 - Many of these transitions do not lead to improvement, and industries differ in the number of opportunities
 - Retraining to move to a completely different occupational cluster may be the best option for some workers
- **Implications for practice: one good step or many steps?**
 - Career pathways training envisions multi-step pathways
 - One step programs vs. many step programs
 - Worker profile data will allow us to describe the viability of whole pathways envisaged by career pathway program planners



Next Steps

Next Steps



- Continue and complete analysis
 - Incorporate NLSY and worker profile data
- Consider key questions
 - What criteria should we be using to categorize and group transitions?
- Plan for dissemination
 - How should we leverage visualization tools?
 - Plan to create interactive visualizations
 - How can we disseminate findings in a way that is accessible to practitioners?

NLSY Characteristics



- NLSY: Longitudinal survey of almost 9,000 men and women born between 1980 and 1984
- Like the CPS:
 - Offer representative sample of the general population
 - Has limited coverage of less common occupations
 - Unlike the CPS, tracks people over a long period of time

Worker Profile Data



- Obtained through a vendor license
- Compiled from resumes and social media profiles
- Covers nearly all occupations
- Includes over 100 million workers
- Is a valid data source for the study of transitions
- Is not representative of the general population, so will need to be adjusted using federal survey sources

Future Work on Interactive Visualization



- Extends the static visualizations already constructed
- Allows interested parties—workers, practitioners, policymakers, researchers—to navigate through the landscape of real occupational transitions
- Useful in determining what transitions are feasible
- Useful in seeing the wages and training associated with each occupation, and in comparing occupations that are close to one another in the transition matrix

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