

## Cause/Solution and Effect Diagram

**In Collaboration with the Illinois Department of Public Health Center for Rural Health and the Office of Health Promotion (OHPm), Oral Health Section Team Members, and Amanda McCarty and John Moran of the Public Health Foundation<sup>1</sup>**

**December 2024**

***“Innovation is creativity with a job to do.” — John Emmerling<sup>2</sup>***

**Introduction:** The Public Health Foundation (PHF) is always interested in presenting new and innovative approaches to using Quality Improvement (QI) tools and techniques that help improve the effectiveness of a health department’s processes. This project was led by the Illinois Department of Public Health (IDPH) Office of Performance Management’s *Journey to Performance Excellence: Team Project Launch* initiative with funding from the Public Health Infrastructure Grant (PHIG) and facilitated by the Public Health Foundation. The IDPH was accredited by the Public Health Accreditation Board in 2015 and reaccredited in 2022.

**Overview:** The Cause/Solution and Effect Diagram presented here (see Figure 5) is an adaptation of the Cause-and-Effect Diagram<sup>3</sup> and Solution and Effect Diagram<sup>4</sup> and was developed by the IDPH Center for Rural Health and the Office of Health Promotion (OHPm), Oral Health Section. The project, *Updating Dental Providers in the HRSA Shortage Designation Management System (SDMS)*, is where IDPH used this tool. The problem statement focused on the lack of data access: *Unable to get accurate and/or complete provider data.*

**When To Use:** When a QI Team has completed the Cause & Effect and Solution & Effect diagrams, and has prioritized the top causes and potential solutions, they can then combine them on the Cause/Solution and Effect diagram. These tools provide a comprehensive picture of causes and potential solutions.

### **Construction Steps:**

**Step 1:** Define the problem that the QI Team is focusing on and develop an AIM statement as shown in Figures 1 and 2.

**Step 2:** Collect associated data to establish a baseline and set targets for improvement.

**Step 3:** Complete the QI investigation process and develop the Cause & Effect Diagram, as shown in Figure 3, and prioritize the potential major causes to develop potential solutions.

**Step 4:** Complete the Solution & Effect Diagram, as shown in Figure 4, and prioritize by impact and effort.

**Step 5:** Combine the Cause & Effect and Solution & Effect diagrams into one diagram for ease of viewing of the potential changes and their associated impacts on the process being improved as shown in Figure 5.

**Step 6:** Develop a Gantt Chart and Implementation Plan.

---

<sup>1</sup> Authors bios are at the end of the article.

<sup>2</sup> <https://jdmeier.com/innovation-quotes/>, accessed December 18, 2024.

<sup>3</sup> *Public Health Quality Improvement Encyclopedia*, J. Moran, et al, Public Health Foundation, © 2012, pp: 11-12.

<sup>4</sup> *Public Health Quality Improvement Encyclopedia*, J. Moran, et al, Public Health Foundation, © 2012, pp: 125-126.

**Example: Updating Dental Providers in the HRSA Shortage Designation Management System (SDMS)**

## Updating Dental Providers in the HRSA Shortage Designation Management System (SDMS)

**Purpose:**

Accurate provider data is needed to accurately designate Health Provider Shortage Areas (HPSA) in Illinois to increase access to oral health services.

**Problem: Lack of data access**

Unable to get accurate and/or complete provider data.



<b>Baseline:</b> (11/13/24)	
6,884	Eligible dentists in Shortage Designation Management System (SDMS)
4,541 (66%)	Location needs verified
318 (4.6%)	Tour Hours greater than 40
632 (9.2%)	Primary Address Change needs verified
49 (0.7%)	Taxonomy Change needs verified

Figure 1

	<b>AIM STATEMENT</b>
	<p>By March 31, 2025, IDPH will update 90-100% of the Dental Health Provider data needed to process Health Professional Shortage Areas (HPSA) in Illinois in the federal Shortage Designation Management System.</p> <ul style="list-style-type: none"> <li>• License status</li> <li>• Address</li> <li>• Direct patient hours</li> <li>• Medicaid data</li> </ul>

Figure 2

## Cause and Effect

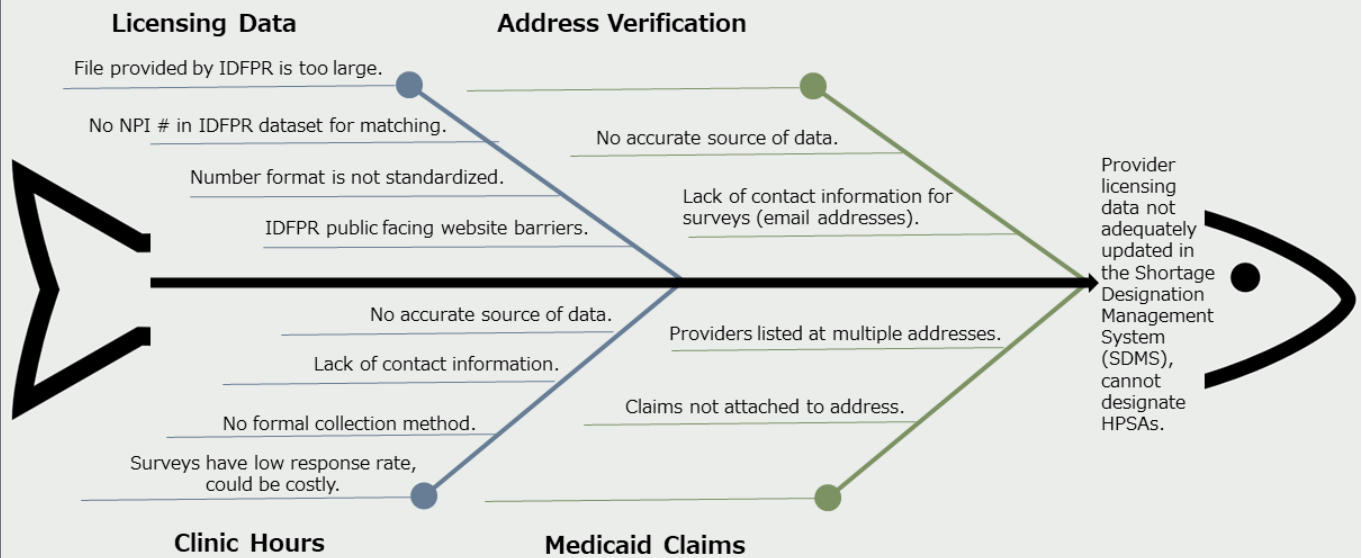


Figure 3

## Solution and Effect

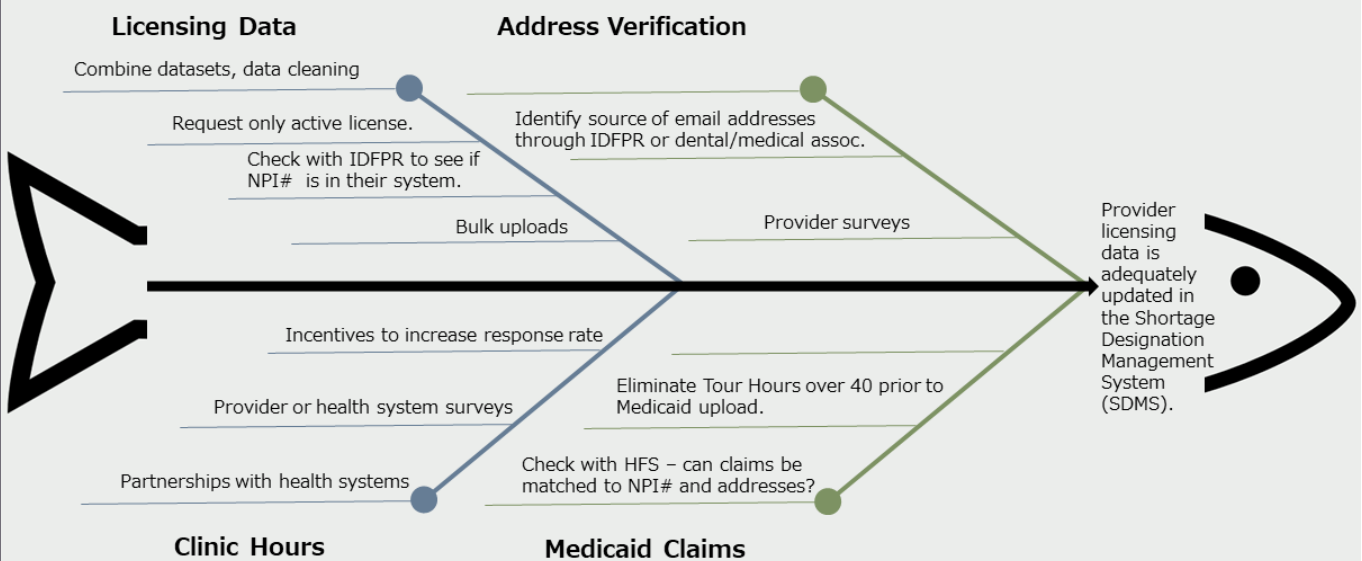


Figure 4

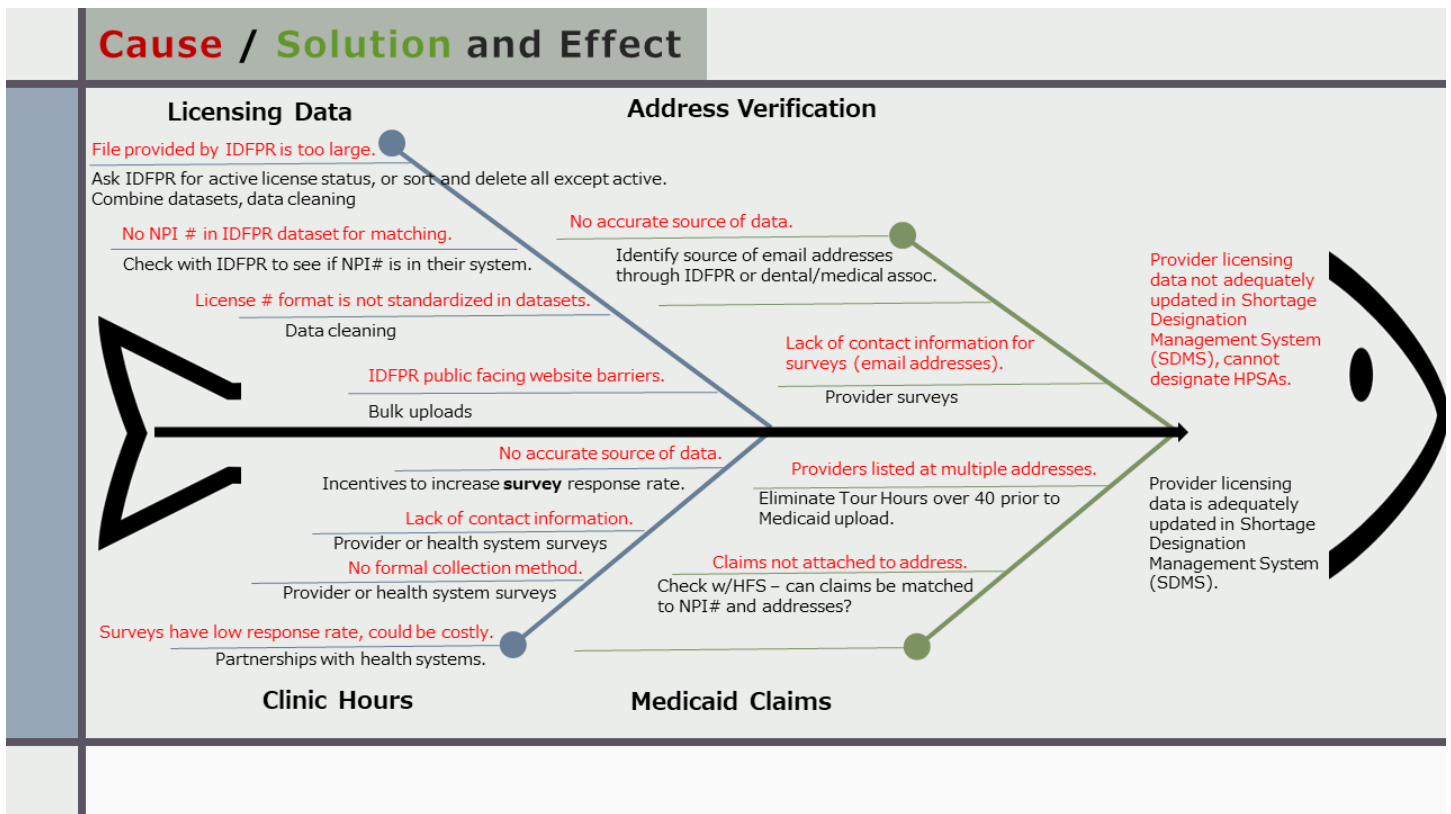


Figure 5

### Concluding Remarks:

PHF thanks the IDPH Center for Rural Health and the Office of Health Promotion, Oral Health Section for the development of this innovative tool and allowing us to present it to those practicing QI in the public health field.

Thanks to the IDPH Office of Performance Management, Deputy Director, Sylvia Riperton-Lewis, MJ, MPH, CPHQ, BCD for the opportunity to work with the QI Teams to implement *Journey to Performance Excellence: Team Project Launch*.

### Authors Bios

Updating Dental Providers in the HRSA Shortage Designation Management System (SDMS) Team Members  
Center for Rural Health, Illinois Department of Public Health:

Kristen Nolen, Section Chief

Carla Cox, Primary Care Office Manager/Analyst

Lisa Buker, Office Associate

Stacey Herman, Grants Manager

PHF Authors:

Amanda McCarty, MS, MBA, MHA, is the Senior Director of Health Sciences at the West Virginia Higher Education Policy Commission. She is also an Adjunct Professor in Health Care Administration at West Virginia University Institute of Technology. From 2012-2016, she served as the Director of Performance Management & Systems Development at the West Virginia's Bureau for Public Health. At the Bureau, Amanda was a member

of the health department's leadership team and was responsible for accreditation, performance management, strategic planning, workforce development and quality improvement efforts. Prior to joining the Bureau, Amanda worked for Mountain State Blue Cross Blue Shield/Highmark, Inc. in health promotion and disease prevention.

John W. Moran, Ph.D., MBA is Senior Quality Advisor to the Public Health Foundation and a Senior Fellow at the University of Minnesota, School of Public Health in the Division of Health Policy, and Management 2010 – 2015. A member of PHAB's Evaluation and Quality Improvement Committee 2013 – 2015 Adjunct Professor Arizona State University College of Health Solutions' School for the Science of Health 2013 – 2016.