



HOW TO

Present Missing Data Clearly

Engaging Consumers in Quality Information

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Why Is It Important To Clearly Explain Reasons for Missing Data?

Explaining why data are missing from comparative quality reports improves the transparency and consumer-friendliness of reports, thus facilitating an understanding of differences in quality. In turn, this improves consumers' confidence in the data and motivates and enables their use of the information in decision-making. Consumers typically do not know how to interpret statements of missing data. Some consumers even state that health professionals with missing data are doing worse than those with the lowest ratings or scores. Providing clear missing data explanations may improve consumers' response to health professionals without data as well as health professional engagement in reporting activities.

Consumers' Interpretation of Missing Data May Impact Their Decisions

- Consumers tend to ignore or be unwilling to visit health professionals for whom no data are available, presuming they are hiding something negative. Detailed reporting of missing data gives consumers a more complete picture of who is reporting, who is not, and why.
- Consumers consistently say they want details, including details about why data are missing. Without appropriate information about why data are missing, consumers are left to draw their own conclusions that may or may not be accurate.

Effective Missing Data Explanations May Improve Health Professional Engagement

- Appropriately reporting on missing data can have a positive effect on stakeholders. For example, it highlights those health professionals who have submitted data, which may give health professionals whose data are missing a greater motivation to participate fully in reporting.

About Aligning Forces for Quality

Aligning Forces for Quality (AF4Q) is the Robert Wood Johnson Foundation's signature effort to lift the overall quality of health care in targeted communities, as well as reduce racial and ethnic disparities and provide real models for national reform. The Foundation's commitment to improve health care in 16 AF4Q communities is the largest effort of its kind ever undertaken by a U.S. philanthropy. AF4Q asks the people who get care, give care and pay for care to work together to improve the quality and value of care delivered locally. The Center for Health Care Quality in the Department of Health Policy at George Washington University School of Public Health and Health Services serves as the national program office. Learn more about AF4Q at www.forces4quality.org. Learn more about RWJF's efforts to improve quality and equality of care at www.rwjf.org/qualityequality/af4q/.

About the Author

American Institutes for Research (AIR) provides technical assistance for the Robert Wood Johnson Foundation's *Aligning Forces for Quality* initiative. AIR is working with Aligning Forces communities to support consumer engagement efforts to promote higher-quality health care at lower cost and authored this publication.

- As such, accurately and fairly describing why data are missing may improve an Alliance’s partnerships with and engagement of health professionals. Health professionals may be more willing to participate in data collection and reporting activities if they feel they will be fairly and accurately represented.
- Health professionals who feel their missing data are presented and described poorly or inaccurately in public reports may feel they are being unfairly penalized.

Feedback from Consumers

“‘Below average,’ you know that they didn’t do a good job. For not reported, you don’t know what kind of job they did. You can’t compare them.”

“[It’s] kind of a tie between below and declined. [I’m] not sure if below or declined is better.”

Clear explanations of missing data are beneficial to consumers, health professionals, and Alliance relationships. Several resources and research activities used to make recommendations on the effective ways of displaying missing data are described in the next section.

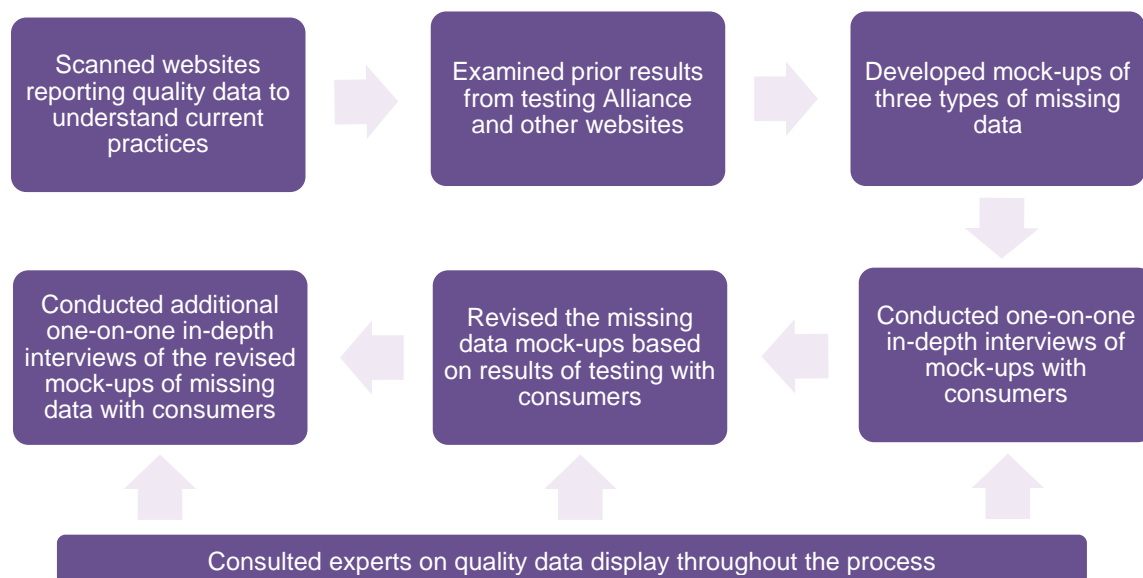
How Did You Determine Effective Ways To Display Missing Data?

The key principles of effectively displaying quality data are relevant for addressing missing data. Use the following principles and strategies discussed in the [How To Display Comparative Information That People Can Understand and Use](#) guide when presenting missing data.

Make it easy to identify and understand patterns. Use visual shortcuts to let users easily compare health professionals to each other and determine whose performance is better or worse than the chosen comparison point. Consider using word icons as they offer a way to communicate relative performance concisely and clearly.

Help users focus on topics or health professionals of interest. Employ rank ordering and tiering of data. It is important to list all health professionals with missing data, but place them at the bottom of the list or group them together.

The principles for displaying comparative information are applicable to this and many related issues. These principles were one of the key resources used in developing and testing the recommendations for presenting missing data included in this guidance document. The figure below describes the activities used to understand further how to present missing data.



Based on the activities mentioned above, we are able to provide recommendations for how to display missing data effectively.

What Should I Do To Display Missing Data Effectively?

Based on usability testing, we recommend listing non-reporting health professionals and explaining why there are no data. In addition, health professionals with missing data should appear in the display, appearing below the health professionals with data. There are different methods for displaying and explaining missing data. The pros and cons of each method are discussed below.

How to explain why there are no data for certain health professionals

Use short sentences or phrases in the cell where data would normally appear

- Short sentences provide more information than other display options.
- By including the information entirely within the display, you can show consumers why the information is missing without having to refer to a different area of the report (e.g., footnote, key/legend, roll-over, statement at the top of the page, or a link/pop-up window).
- It takes discipline to keep sentences really short. Lengthy sentences may distract from the other data on the page. Further, the current website display may not allow for a lengthy sentence to be included.

Short Sentence Example

Dr. D. Rault	Not reported due to less than 100 completed surveys
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Consider using word icons where possible

- Word icons can sometimes provide the same amount of information as short sentences.
- Word icons combine the use of color, shape, and words to help consumers quickly differentiate health professionals who are missing data from those who are better, average, or below.
- If word icons are overly prominent, they may distract from the performance scores for the health professionals with data.
- Identifying a single word or short phrase to explain missing data is challenging.

Word Icon Example

Dr. S. Rowe	 this topic does not apply
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Do not use symbols

- Symbols require consumers to search for a definition (as in a legend or a key), adding a barrier between the consumer and the explanation.
- Symbols may draw attention to the health professionals with missing data, distracting consumers from health professionals with performance scores.
- The choice of symbol can be challenging. In testing, participants viewed an open circle as a zero or as signaling emptiness or low performance. Participants viewed an asterisk as an indication that there was an exception—and potentially an explanation elsewhere on the page—for those health professionals.

Symbol Example

Dr. L. Durso	
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Do not use acronyms

- Consumers are familiar with acronym “N/A” to represent “not applicable” or “not available.” However, there are other reasons for missing data that need to be conveyed.
- In testing, consumers were unfamiliar with nearly all other acronyms representing reasons for missing data, such as “TF” (too few patients), “ND” (no data), and “DNR” (did not report). These acronyms required participants to search for a definition, again adding a barrier between the consumer and the information.

Acronym Example

Dr. G. Parron	NR
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- If consumers do not know how to find out what an acronym means, they will tend to assert their own meaning, potentially leading to misuse of information.

Do not omit health professionals without data from the display

- Omitting health professionals without data helps users limit the number of health professionals they compare. However, in testing, participants searching for a specific health professional wondered why they did not appear. Omitting health professionals without any information to report may cause report users to question the validity and reliability of the site.
- Health professionals with some, but not all, data make applying this display method challenging. In testing, participants were confused why health professionals appeared on some pages but not all. For pages with more than one measure, a second display technique was needed to explain why data appeared for some but not all topics.
- Consumers may not locate, read, or click on statements or links that provide an explanation of why some health professionals or data are omitted.
- When there are multiple reasons why data might be missing and the specific reason is not specified, the display leaves the consumer to guess which reason applies to which health professional.
- Omitting health professionals without any data may reduce the potential motivation for health professionals to participate and improve.

Omission Statement Example

How Well Doctors Communicate with Patients

The following doctor's offices reported a very small number of applicable cases: [click here to view](#).

Applying these general principals and guidance to quality reports will improve understanding of missing data. For more specific guidance on conveying three common reasons for missing data, please refer to our additional resources.

Additional Resources:

How-To Guides for Three Reasons for Missing Data

Although there are a number of specific reasons why quality data reports may be missing for a health professional, we have specific guidance available in a separate document that focuses on three key reasons:

1. **Too few patients:** When too little data exists to report results reliably
2. **Did not report:** When a health professional does not report information
3. **Not applicable:** When information is not relevant to the health professional

For each reason we provide an explanation of the type of missing data, an example of when this type of data goes missing, recommendations and considerations for displaying this type of data, and information on displays that are ineffective.