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QUALITY ASSURANCE PROCEDURES FOR THE
UNIFORM REPORTING SYSTEM FOR TITLES I
AND II OF THE RYAN WHITE CARE ACT

FINAL REPORT

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UNIFORM REPORTING SYSTEM FOR TITLES I
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CONTENTS

Chapter		Page
I	PROJECT OVERVIEW	1
II	ACTIVITIES CONDUCTED BY MPR	3
	A. PHASE I: REVIEW MODELS OF QUALITY ASSURANCE PLANS ..	3
	B. PHASE II: DEVELOP DRAFT URS QUALITY MEASURES AND STANDARDS	4
	C. PHASE III: APPLY DRAFT MEASURES AND STANDARDS TO PILOT TEST DATA	5
	1. Preparing for the Site Visits	5
	2. The Site Visits	7
	D. PHASE IV: FINALIZE THE MEASURES AND STANDARDS BASED ON THE RESULTS OF THE PILOT TEST DATA EVALUATION	9
	E. PHASE V: PREPARE FINAL QA PROCEDURES	9
	F. URS EDIT SOFTWARE	10
III	SUCCESSSES AND CHALLENGES EXPERIENCED	13
IV	SUGGESTIONS FOR CONDUCTING SIMILAR PROJECTS IN THE FUTURE.....	15

I. PROJECT OVERVIEW

The Ryan White CARE Act of 1990 assists states, metropolitan areas and providers in the development of **services** for persons with acquired immunodeficiency syndrome (AIDS) and human **immunodeficiency** virus (HIV) infection. Titles I and II of this Act provide grants to disproportionately affected metropolitan areas and states to improve the availability and coordination of services for HIV-infected people. The Bureau of Health Resources Development (BHRD) in the Health Resources and Services **Administration (HRSA)** is responsible for monitoring and evaluating the activities that take place under Titles I and II of this Act. In order to support this oversight function, **HRSA** developed the Uniform Reporting System. Through this system, Ryan White grantees will submit to **HRSA** provider-level **administrative** data and person-level data on demographics and services received. The URS data will be used to assess the extent to which the goals of the Act are being met. In addition, information obtained through the URS will help HIV planning councils, state agencies, and consortia to target and monitor the provision of services to specific population groups.

The value of using the URS data to support planning and administrative activities depends on both the accuracy and completeness, or the quality, of **URS** data at initial implementation and over time. To develop its own understanding of the quality of URS data and to monitor data quality over time, **HRSA** asked **Mathematica Policy Research (MPR)** to develop a Quality Assurance (QA) Plan for the URS. In the sections that follow, we describe the activities **MPR** performed during preparation of the QA plan, **discuss** the difficulties experienced during the project and provide suggestions for conducting similar projects in the future.

Our discussions focus on the procedures and activities conducted during the project. Results of the procedures are described in various project documents available elsewhere.



II. ACTIVITIES CONDUCTED BY MPR

As originally envisioned, the project was to **consist** of the **following** main phases:

- Review Models of Quality Assurance Plans
- Develop Draft URS Data Quality Measures and Standards, incorporating ideas and approaches used in plans reviewed in the preceding phase
- Apply these Draft Measures and Standards to Pilot Test Data
- Finalize the Measures and Standards Based on the Results of the Pilot Test Data Evaluation
- Prepare final QA Procedures

The activities performed in each phase, **and** the deviations from planned activities, are discussed below.

- A . PHASE I: REVIEW MODELS OF QUALITY ASSURANCE PLANS

MPR originally intended to examine and evaluate the quality assurance standards of three national data sets similar to the URS. The comparison systems were to be selected on the basis of comparability with the URS in terms of data content and data collection procedures and the presence of a well-developed and well-tested quality assurance plan. While many existing data systems possessed some similarities with the URS, we were unable to find any systems that combined a data flow similar to the URS with well-documented quality assurance procedures and standards. As a result, **MPR** focused on documenting the quality assurance procedures of twelve systems, emphasizing those characteristics of each data system most similar to the URS.

We found that most systems used informal quality assurance procedures and standards. These procedures and standards were typically poorly documented or not documented at all. Most procedures relied heavily on the experience of staff and the use of ad hoc quality checks. For example, system staff

would typically perform ad hoc queries of submitted data when the data looked “suspicious”. None of the systems possessed a well-defined, formal QA plan. None of the sites used mechanistic, empirical-based procedures that could be carried over to the URS QA plan. Our review did provide several useful suggestions on activities that foster improved quality in data.

Overall, the results of this phase of the project were disappointing as we were unable to identify a model upon which to base the URS QA plan.

B. PHASE II: DEVELOP DRAFT URS QUALITY MEASURES AND STANDARDS

Because of the absence of a model QA system, MPR developed a URS QA Plan from scratch. The plan followed the outline originally suggested in our project proposal and had the following characteristics.

- Sites would be asked to develop a Quality Profile, a document that lists and discusses the sources and magnitudes of different types of data errors within their system. All types of errors would be included in the Quality Profile, including errors related to population coverage, time periods, accuracy, interpretation, consistency and completeness.
- The errors measured and documented in the Quality Profile would then be compared to the URS Quality Standards, which would specify acceptable levels of data quality.
- The final, and perhaps most important, component of the plan would be the Quality Assurance Procedures workbook. This document would instruct providers, consortia, grantees, and HRSA on how to prepare a Quality Profile for their data. It would also provide guidance on procedures and activities that could be used to improve and monitor data quality.

MPR prepared draft versions of each component of the QA plan. Because of the failure to identify standards in other data systems, we developed our own preliminary list of quality targets. We presented the draft plan incorporating the preliminary quality targets to HRSA for their review and approval prior to developing a site visit protocol for the next phase of the project.

HRSA rejected the draft QA plan as too cumbersome and burdensome for the sites. We were instructed to focus the content of the site visits and the resulting QA plan on those types of errors that are observable in client-level data provided to HRSA by grantees and providers during the URS field test.

C. PHASE III: APPLY DRAFT MEASURES AND STANDARDS TO PILOT TEST DATA

MPR and HRSA staff met with selected service providers and grantees that participated in the URS Field Test. The original plan as described in MPR's project proposal, called for site visits to evaluate a draft version of the QA plan. The goal was to test the site's ability to develop a Quality Assurance Profile and to evaluate the usefulness of the Quality Assurance workbook. At HRSA's direction, the purpose of the visits was altered to be limited to 1) review errors observed in data submitted as part of the URS Field Test, 2) obtain their thoughts on URS data quality issues and 3) obtain feedback on HRSA's plans for monitoring and improving data quality in future reported URS data. The steps involved in preparing for the visits and conducting the visits are described below.

1. Preparing for the Site Visits

Several sets of materials were developed in preparation of the site visits. These materials are described below.

a. Data Error Profiles

HRSA prepared an analysis of potential problems (error profiles) based on field test data supplied by the selected service providers and grantees. MPR/HRSA developed a site visit protocol that would allow us to review these error profiles and discuss:

- the structure and terminology used in the error profiles
- the data errors (invalid/questionable/unknown values for specific variables) for each provider/grantee and the potential causes for the errors

- procedures used during the field test that appeared most effective in improving data quality and possible changes in procedures that could decrease/eliminate data errors

b. URS Targets

HRSA/MPR also developed **preliminary** suggested “quality targets” for URS data. Our protocol was designed to obtain reactions to:

- the targets in general and how they were determined
- the “reasonableness” of the specific targets for each variable on the provider’s error profile
- the quality assurance (QA) procedures needed to achieve the targets

c. Changes in QA Procedures and Future Plans

During the field test, each service provider provided their grantee (and HRSA) with information on QA procedures used during the field test. Since this information was now over one year old, the protocol included questions designed to obtain information on:

- any changes in QA procedures since the field test
- the effectiveness of current procedures
- changes to procedures planned for the future

d. HRSA’S Plans to Improve Data Quality

The proposed QA targets were only one component of the overall QA plan. The plan also included **methodologies** for measuring, evaluating and monitoring data quality. We prepared materials that provided a review of the overall QA plan and allowed us to obtain feedback on:

- the feasibility of the plans
- the plan's advantages and drawbacks
- ways that the plan could be improved supplemented, and made easier to implement

2. The Site Visits

During the Spring of 1994, HRSA selected Houston, Florida, Virginia, and Louisiana for site visits.

Prior to the site visits, MPR and HRSA distributed the following materials to each grantee:

- A letter of introduction to the grantees
- A proposed agenda for each meeting
- A summary list of topics to be covered at each meeting with the grantee
- A summary list of topics to be covered at each meeting with providers
- A detailed list of questions that would be asked at each meeting
- A short description of HRSA's proposed QA plan
- Date Error Profiles showing errors and questionable values provided to HRSA during the URS Field Test.

Schedules and logistics for the visits were handled by HRSA. The visits were conducted during the Summer and Fall of 1994.

HRSA originally had plans to conduct six site visits. Because of the time that elapsed between the end of the field test and this project, individuals at several of the sites HRSA had hoped to visit were no longer available or elected not to participate. HRSA decided to supplement the information obtained from the site visits with material distributed via mail to representatives from the states of Washington and Michigan.

The visits were conducted in an informal manner that generally followed the protocol materials. The first session at each site was conducted with the grantee. Separate sessions with each provider followed. In some instances the grantee representatives also attended the provider sessions.

Each session started with an analysis of the data provided to HRSA during the field test. The discussions during this part of the session focused on the written analysis and error profiles prepared by HRSA. The written analysis provided an overview of the field test data submission and described observed instances of invalid codes, unknown responses, and questionable values. This analysis was presented for the grantee, using all data provided to HRSA, and for each provider separately. The accompanying error profile table showed the incidence of unknown invalid, and questionable values for each URS data element.

We next presented the participants at each session with suggested quality targets for each URS data element and asked for their comments on the reasonableness or feasibility of achieving these targets. In several cases, we asked the participants to review the targets after the session and provide us with their own suggested targets.

The remainder of the session was spent reviewing the QA procedures used during the field test and discussing changes that may have occurred in these activities since the field test ended. We also attempted to obtain information about planned future changes to each provider and grantee data system and accompanying QA activities. We also provided sites with a brief overview of HRSA's QA plan. The presentation to grantee representatives was somewhat more detailed due to descriptions of materials that are designed to assist grantees in setting up QA plans for their organizations and providers,

After each visit, MPR prepared memoranda summarizing the discussions that took place during the visit. We also prepared memorandum describing materials obtained from the two mail sites, Michigan and Washington.

While the details of each visit varied, as documented in the summary memoranda, several **general** conclusions appeared:

- Detailed **analysis** of the error profiles from the URS field test data was of somewhat limited **value**. In many cases, enough time had lapsed between the field test and the site visit that the individuals responsible for field test data were no longer available, there had been a major change in the data system, or both.
- Discussions of the ability to achieve the proposed quality targets were very useful. **The** feedback provided by the grantees and providers allowed MPR and HRSA to fine-tune the target values.
- Discussions of QA procedures already in place or planned for each site were useful. They provided MPR **staff with** example activities or procedures that have been incorporated into the final QA plan.
- Descriptions **of** the proposed URS QA plan were of such a general nature that providers and grantees were unable to give us explicit suggestions for changes to the QA plan.

D. PHASE IV: FINALIZE THE MEASUREMENTS AND STANDARDS BASED ON THE RESULTS OF THE PILOT TEST DATA EVALUATION

MPR prepared **final** versions of quality targets using as input the comments obtained during the site visits. We provided a rationale for the value of each target and any changes from the draft targets. We also followed the suggestions of grantees and providers to revise the format of the error profile forms. For example, one site suggested that for some URS data elements, a target range rather than an absolute value would be preferred. The revised targets and forms were the basis for the final worksheet profile forms included in the Grantee/Provider and HRSA QA manuals described below.

E. PHASE V: PREPARE FINAL QA PROCEDURES

After completion of the final targets and error profile forms, a new project officer was assigned to the project and the focus of the project changed. We were asked to retain the aspects of the QA plan that emphasized the analysis of errors directly observable in the submitted URS data. In addition, we were asked to add materials that could be used by grantees and providers to evaluate data errors not directly

observable in the submitted data and to help them implement procedures that would improve data quality. While this fell short of MPR's original plan to require sites to prepare formal Quality Profiles, much of the material prepared for the original **draft** Quality Assurance Plan was directly applicable to the new approach. We therefore were able to borrow heavily from our draft workbooks and other materials in preparing Quality Assurance Manuals for the grantees, providers and **HRSA**.

The manuals prepared by MPR start with an **overview** of the **URS** Quality Assurance Plan. This is followed by a discussion that details the use of quality profiles, quality targets and the preparation of Quality Improvement Plans. The manual continues by describing basic steps to obtaining quality data providing strategies for identifying sources of data errors and suggesting activities for improving data quality. Appendices include a more theoretical discussion of data quality concepts, instructions for satisfying **HRSA's** QA requirements and a description of how to use **HRSA's** TOOLBOX data quality software. Separate manuals were prepared for grantees/providers reporting Annual Administrative Reporting (AAR) data and grantees/providers reporting client-level data. A third manual was prepared for use by **HRSA** staff. Sections of the grantee/provider manuals were reviewed by several grantees. Their comments were incorporated into the final versions of the manuals,

F. URS EDIT SOFTWARE

Several grantees and providers expressed the need for computer software that would help identify quality problems in their data and that would automate the preparation of error profiles, **HRSA** requested that **MPR** prepare software to perform these functions, with the goal of integrating the software into future versions of the **URS** TOOLBOX. The software **MPR** developed generates the following reports using grantee and provider **URS** data submissions:

- *Missing/unknown values* - a report identifying occurrences of missing or unknown data elements within each data record

- *Data consistency* - a report displaying logical and numerically inconsistent data within each data record
- *Quality assurance targets* - a report listing each data element in the URS and whether or not the quality target was achieved
- *Volume of missing/unknown values* - a summary report showing counts of missing and unknown values for each data element in the URS
- *One-way frequency distributions* - a summary report showing the **frequency** of specific values of each data element

III. SUCCESSES AND CHALLENGES EXPERIENCED

We would like to emphasize that we view the project as a success. The Quality Assurance manuals will help increase the awareness of data quality issues which will result in improved URS data. Other aspects of the plan including frequent preparation of error profiles, feedback from HRSA to the sites, adding QA software to the URS TOOLBOX and the development of Quality Improvement Plans by grantees will also lead to better URS data. Achieving this success required the assistance of many individuals from HRSA, MPR, and grantees and providers. We appreciate all of their efforts.

However, like any project of this magnitude, there were some difficulties. The difficulties centered around these factors:

- **The timing of the project.** The elapsed time between the URS Field Tests data collection and the site visits limited our ability to obtain information on the source of observed errors in URS data. Many of the individuals involved in collecting and reporting URS Field Test data were no longer available.
- **Optimistic scheduling.** Our inability to identify existing systems with documented QA plans resulted in delays during the initial stages of the project. Difficulties in identifying URS field test sites willing and available to participate in this project resulted in additional project schedule slippages. Canvassing sites for comments on initial drafts of URS QA targets and draft manuals also resulted in delays.
- **Changes in project focus.** The shift away from a comprehensive approach to a more mechanistic approach prior to the site visits changed the purpose of the site visits. With the shift back to a more comprehensive approach after the site visits, many of the activities originally intended became relevant again, but the visits had already been completed. As a result, several of the Quality Assurance activities suggested in the QA manuals could have been tested but were not.

IV. SUGGESTIONS FOR **CONDUCTING** SIMILAR PROJECTS I-N THE FUTURE

HRSA should be congratulated for the development and subsequent implementation of a formal and well-documented Quality Assurance Plan for the **URS**. The success achieved reflects well on **HRSA's** approach to conducting an ambitious effort like this project. In spite of this success, we feel altering the **timing** of the project could have resulted in an improved final product.

Early in the development of the **URS**, **HRSA** expended substantial resources working with grantees and providers to define the contents and operation of the **URS**. While there was some discussion of **QA** activities, including the need for verification tables and feedback from **HRSA**, there was no effort to develop a formal **QA** plan as an integral part of the **URS**. In fact, this project was the first attempt to develop such a formal **QA** plan. **In** hindsight, development of the **QA** plan should have proceeded simultaneously with development of the **URS** itself. This approach would have maximized the input from grantees and providers. Early development of a **QA** plan would have also allowed testing of the plan during the **URS** Field Test. **HRSA** would then have had a better grasp of the resources and training required to operate the **QA** Plan.

While earlier implementation of this project may have been advantageous, we believe that the **QA** plan and supporting materials developed under this project will be an important component in the continuing success of the **URS** data system.