

Morbidity and Mortality Weekly Report (MMWR)

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Introduction

Supplements

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This supplement of *MMWR* celebrates the 50th anniversary of CDC's first publication of *MMWR* on January 13, 1961 (Figure 1). *MMWR* was not new in 1961, but it was new to CDC, an agency that itself had been founded only 15 years earlier, in 1946 (1). The longer history of *MMWR* traces back to July 13, 1878, when the first predecessor of *MMWR*, called simply *The Bulletin of the Public Health*, was inaugurated. The Bulletin was established in accordance with the first National Quarantine Act, passed by Congress 2 months earlier. The Act ordered the Surgeon General of the U.S. Marine-Hospital Service to begin publishing abstracted disease reports collected from U.S. consuls in foreign lands to alert U.S. quarantine officials about what diseases could be expected among passengers arriving on steamships (2,3). In the 83 years from 1878 to 1961, *MMWR* went through several incarnations. By 1952, the publication had its current name and was being published by the National Office of Vital Statistics, an agency within the U.S. Department of Health, Education and Welfare. In 1960, CDC's renowned chief of epidemiology, Alexander D. Langmuir, decided that *MMWR* should be transferred to CDC (then known as the Communicable Disease Center). After much discussion, and as Langmuir later said in an interview, "all sorts of pulling out teeth by the roots without anesthesia and all kinds of internal frictions," in 1960, *MMWR* was transferred to CDC (4).

In 2009, as the 50th anniversary of *MMWR* loomed, the *MMWR* Editor (F.E.S.) began discussions with leaders at CDC and the *MMWR* Editorial Board about how best to commemorate this date. Members of the Board, editors, and friends of *MMWR* offered many good ideas. In the end, the most

persuasive idea was to celebrate the 50th anniversary simply by doing what *MMWR* has done best for 5 decades at CDC: publish articles of high value to its readers. The title of the supplement is "Public Health Then and Now: Celebrating 50 Years of *MMWR* at CDC." The supplement's guest editors (F.E.S., K.S.K., L.M.L., S.B.T.) selected a cadre of expert authors who have long experience in their respective fields of public health---enough to enable them to look back over the past 50 years and trace the most important influences and developments. The guest editors asked the authors to answer three key questions. What was the state of the art in 1961? How did it develop through 50 years into its present form? What does the future hold? Thus, with few exceptions, the 16 articles that make up this supplement are not meant to be about *MMWR* but instead are meant to trace the development of key areas of public health through the 50-year era of *MMWR* at CDC.

The authors took up the challenge admirably. The result is a diverse set of articles that portray public health in 1961 and forward in time to the present and beyond. The articles range from detailed historical review, to analyses of MMWR content, to the more whimsical. They are not meant to be exhaustive, nor can they treat their topics as thoroughly as would a longer text, but they do depict the main events, developments, and innovations that led public health to where it stands today.

What is MMWR?

In 1996, on the occasion of the 50th anniversary of CDC, three long-serving editors of *MMWR* restated the purpose of the publication: "...to report events of public health interest and importance to CDC's major constituents---state and local health departments---and as quickly as possible", and to distribute "... objective scientific information, albeit often preliminary, to the public at large" (5.). Although the content of *MMWR* has changed since its inception in 1878, by and large it has included three basic elements: 1) short reports about acute public health events, such as outbreaks of infectious diseases, environmental events, clusters of noninfectious diseases, and analyses on the incidence and prevalence of chronic diseases, conditions, or related behaviors; 2) longer reports and supplements on public health surveillance, policy recommendations, and special topics; and 3) statistical tables on the week's morbidity and mortality in the United States, with a wrap-up report published after the end of the surveillance year. Over the years, these elements have changed in scope, complexity, length, and other attributes, but they remain the core of *MMWR*'s content.

MMWR has been the first source of information for many important public health events. Perhaps the best known is an MMWR report titled "Pneumocystis pneumonia---Los Angeles," which was published on June 5, 1981 (6). It described five cases of an immunosuppressive illness in previously healthy men who had had sex with men that later became known as acquired immunodeficiency syndrome (AIDS). Many other examples exist of first reports in MMWR. To name just a few examples: in 1970, MMWR reported on a nationwide epidemic of bacteremia associated with contaminated intravenous fluids (7); in 1976, on the occurrence of Guillain-Barré syndrome associated with the swine influenza vaccine (8); in 1977, on the discovery of the organism that causes Legionnaires disease (9); in 1991, on the effectiveness of folic acid for the prevention of spina bifida (10); in 1993, on an outbreak of hantavirus pulmonary syndrome (11); and two years ago, on the first two cases of 2009 pandemic influenza A (H1N1) (12). The traditional function of these first reports has been to fill the scientific information gap between immediate public health notifications through the news media and later publication of full-length articles in the peer-reviewed medical literature (2).

From 1961 to 1985, MMWR consisted only of the weekly publication, usually an eight- to 16-page

booklet containing a few short narrative reports and the weekly morbidity and mortality tables, and the annual *Summary of Notifiable Diseases*. Since 1985, *MMWR* has evolved into the *MMWR* Series, a collection of six different products: 1) the *MMWR* weekly, 2) the annual *Summary of Notifiable Diseases*, 3) *CDC Surveillance Summaries*, 4) *Recommendations and Reports*, 5) special supplements, and 6) the *MMWR* weekly podcasts.

Although the general public best recognizes MMWR by the weekly report and the podcasts, the public health community relies heavily on the other components of the series. The CDC Surveillance Summaries, for example, a series of long-form reports and tables split off from the weekly in 1985 to publish the results of public health surveillance, often represent the only source of published surveillance statistics for certain topic areas. A few examples of recent reports include a report on the prevalence of autism spectrum disorders (13), an annual report on malaria surveillance (14), and a report on out-of-hospital cardiac arrests (15). The Recommendations and Reports series, split off from the MMWR weekly in 1990, consists of official recommendations from CDC. Many of these reports come from the Advisory Committee on Immunization Practices (ACIP) and present official recommendations for the use of childhood and adult vaccines. Recent examples of Recommendations and Reports topics include field triage of injured patients (16), guidelines for diagnosing and treating opportunistic infections in AIDS patients (17,18), and ACIP's guidelines for treatment and chemoprophylaxis of influenza (19). The MMWR podcast series began in 2006 and consists of two weekly podcasts: A Cup of Health with CDC, a 5- to 7-minute podcast, and A Minute of Health with CDC, a 59-second podcast.† Unlike the other five MMWR series, which are aimed at state and local health departments and other health professional audiences, the podcasts are aimed at a consumer audience.

Throughout its history one of *MMWR*'s core functions has been to report routine weekly surveillance statistics. Various forms of statistical tables on mortality and, beginning early in the 20th century, on morbidity, have appeared in *MMWR* since its inception as the *Bulletin* in 1878. For 39 years, the journal *Public Health Reports*, of which *MMWR* was then a part, carried the following motto above its surveillance tables: "No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring." By the time Langmuir brought *MMWR* to the Communicable Disease Center in 1961, he understood that surveillance data collected but never disseminated are of no use, and this understanding has remained part of *MMWR*'s central function (20).

The current *MMWR* weekly contains three morbidity and mortality tables plus a table published quarterly about tuberculosis. Table I lists provisional case counts for 40 infrequently reported nationally notifiable diseases (i.e., those for which <1,000 cases were reported during the preceding year). For example, for the week ending May 14, 2011, the 19th surveillance week for 2011, the table showed 19 cases of measles for the reporting week, 7 cases of noncholera *Vibrio* species infections, and five or fewer cases for all the other listed diseases. Table II lists provisional cases for >20 other selected nationally notifiable diseases for the current week, the median and maximum cases reported over the previous 52 weeks, and the cumulative (year-to-date) count of cases for the current and previous year. The diseases are listed by region and state, plus the District of Columbia, and five U.S. territories. During the 19th surveillance week of 2011, for example, Table II showed that 147 cases of giardiasis had been reported in the United States, including 23 from California, and that 19 cases of hepatitis A had been reported, including three from Georgia.

Table III is a mortality table for 122 U.S. cities. It lists the weekly number of deaths that occurred in the reporting jurisdiction by age group and has a separate column for deaths attributed to pneumonia and influenza. Since the earliest precursors of MMWR, mortality data for major U.S. cities based on death certificates have been reported directly to public health authorities and published in some form of this table. Table III is the nation's only national listing of weekly deaths. Detailed information about deaths by place of residence of the decedent eventually are validated and aggregated into a death file by CDC's National Center for Health Statistics, but the process can take up to 2 years. In a recent issue of MMWR, Table III showed that, during the week ending May 14, 2011, a total of 11,300 deaths were reported from the 122 cities. In Boston, for example, 133 deaths were reported, 86 of them in persons aged ≥ 65 years. Finally, Table IV reports provisional cases of tuberculosis for the current quarter, the minimum and maximum of the previous 4 quarters, the year to date, and the previous year's year to date in each U.S. region, state, and territory, as well as New York City and the District of Columbia.

In 1961, Langmuir made clear that MMWR's primary audience would be state and local health departments (20). Langmuir intended MMWR to be CDC's main method of mass communication with these departments and with the public health community. By the early 1980s, CDC was mailing MMWR free of cost to approximately 120,000 subscribers. In 1982, because of federal budget cuts, CDC was forced to reduce free circulation, but the gap was filled in 1983 by the Journal of the American Medical Association (JAMA), which began reprinting selected MMWR articles in its pages (21), a practice that continues today. In addition, beginning in 1983, the Massachusetts Medical Society began reprinting MMWR to paid subscribers (22),§ another practice that continues today. MMWR began electronic circulation in 1995 (23), and over time, electronic subscription has increased to approximately 100,000. CDC still prints several thousand paper copies of MMWR and sends these free to state and local health departments, members of the news media, libraries, and a few other categories. Together with the circulation at the Massachusetts Medical Society and the U.S. government's Superintendent of Documents, the total print and electronic circulation of MMWR is now 134,000 as of September 2011; however, this number does not begin to capture MMWR readers in JAMA and other publications and approximately 1 million visitors to the MMWR website monthly. In addition, the MMWR podcasts are downloaded by about 50,000 listeners per week.

Langmuir knew that *MMWR* would be of great interest to the news media. Since the 1970s, CDC has given reporters access to *MMWR* articles the day before the articles are published. Today, reporters receive an advance copy of *MMWR* on Wednesday evenings, write their stories over Wednesday night, and then publish them after the *MMWR* media embargo ends at Thursday noon. For 5 decades, most health reports attributed to CDC in the news media likely have originated in *MMWR*. Even today, when viewers of evening television see something that "CDC reported today," often the *MMWR* logo is visible in the graphics. *MMWR* remains a main source of scientific information emanating from CDC, even though other channels, such as informal posting of information on the Web or releases given directly to news organizations, have begun to play a greater role.

Beginning in 2004, *MMWR* began releasing urgent reports outside the routine weekly *MMWR* issue. These reports, called "Early Releases" (formerly "Dispatches"), are sent immediately to electronic subscribers. *MMWR* uses Early Releases when the urgency of the public health problem cannot wait for the issuance of the weekly *MMWR* on Thursday noon. In 2010, CDC began a new monthly communication initiative called "CDC Vital Signs," which is anchored by a scientific report in *MMWR*

(24).

MMWR and Medical Journals

Langmuir sometimes referred to his beloved *MMWR* as a "medical journal." In a 1979 interview, for example, Langmuir boasted that *MMWR*'s circulation of 84,000 qualified it as "one of the largest medical journals in the world" (4). However, *MMWR* has always carefully differentiated itself from medical journals. Even though some of the narrative articles in *MMWR* have the look and feel of articles in medical journals, *MMWR* remains distinct from medical journals---indeed from *all* other health-related publications.

The most obvious differences lie in the long-form *CDC Surveillance Summaries* and *Recommendations and Reports* series. The *CDC Surveillance Summaries* represent the federal government and state health departments reporting official comprehensive surveillance statistics, a function not within the purview of medical journals. Similarly, *Recommendations and Reports* contains official federal public health recommendations, also outside the scope of most medical journals.

Several other differences exist. A major one is that, unlike medical journals (with a few exceptions, i.e., certain special supplements such as this one), the content published in *MMWR* constitutes the official voice of its parent, CDC. One sign of this is the absence in *MMWR* of any official disclaimers. Although most articles that appear in *MMWR* are not "peer-reviewed" in the way that submissions to medical journals are, to ensure that the content of *MMWR* comports with CDC policy, every submission to *MMWR* undergoes a rigorous multilevel clearance process before publication. This includes review by the CDC Director or designate, top scientific directors at all CDC organizational levels, and an exacting review by *MMWR* editors. Articles submitted to *MMWR* from non-CDC authors undergo the same kind of review by subject-matter experts within CDC. By the time a report appears in *MMWR*, it reflects, or is consistent with, CDC policy.

For decades, articles in the *MMWR* weekly written by CDC scientists bore attribution only to the CDC program in which the scientist worked (state or local health department authors were always attributed by name). The intent was to convey to readers that the author of the article was actually CDC as an institution, not the individual contributors. In 2002, the *MMWR* weekly began allowing attribution to individual CDC contributors by name, but even today, reports in the weekly still are attributed to CDC officially as an institution and appear as authored by CDC in the National Library of Medicine's MEDLINE database.

Another identifying characteristic of *MMWR* is its unique format. In its early years, *MMWR* established its trademark short rapid report format for breaking public health problems. In a 1984 memorandum, an *MMWR* editor described the publication's style as having "few adjectives and verbs." During the same year, an observer described *MMWR's* style as "brisk and businesslike, redolent of competence and devoid of levity.... A crisp, lucid, oddly vivid style suggestive of Hemingway as retold by Strunk and White" (25). Although a few reports in today's *MMWR* are perhaps more ornate than those of previous decades, the publication still works hard to retain its short form and almost quirky devotion to careful, precise Spartan language.

Yet another difference between MMWR and most medical journals is its absence of correspondence

from readers, advertising, advocacy, and opinion. Most medical journals are part of a conversation with their readers through publication of letters to the editor and responses from authors. *MMWR* has always accepted letters (now e-mails) from readers and has forwarded these to authors for individual response but has never published correspondence and has left the forums for public health discussion to other publications. *MMWR* contains no advertising or promotional materials, even on behalf of CDC, or any advocacy or self-promotion for CDC or for particular public health programs. Although since the late 1960s *MMWR* has published an "editorial note" for most articles appearing in the weekly (little known fact: these are written by the contributors or the CDC subject-matter experts, not by the *MMWR* editor), in keeping with its status as the official voice of CDC, *MMWR* has never published "opinion" per se. Comments in editorial notes all are in accordance with CDC policy, and no individual opinion appears.

MMWR's continued adherence to an unadorned matter-of-fact style might be part of the reason it has maintained a high level of credibility among its readers. In a survey conducted by Mercer Management Consulting during 2005--2006 among >11,000 subscribers, *MMWR*'s score on credibility was 4.76 of 5.00 (1 = poor, 5 = excellent). In the same survey, *MMWR* scored an average respondent score of 4.60 of 5.00 on quality of content, 4.52 on usefulness, 4.49 on timeliness, and 4.40 on readability. Of 18 publications tested, no publication outscored *MMWR* on credibility, usefulness, or quality of content. Besides its simple style and lack of advertising, another reason for these high reader marks likely is *MMWR*'s association with CDC.

MMWR in the Future

When public health threats arise, one of *MMWR*'s most important traditional functions has been to provide crucial scientific information during that time between the immediate notification to the public about the threat and the later definitive scientific description of the event in a medical journal (2). This important "filling the gap" function has remained a main part of *MMWR*'s mission. As a classic example, on February 1, 2008, *MMWR* published an Early Release report about acute allergic-type reactions among patients undergoing hemodialysis in multiple states (26). The authors said the temporal and geographic distribution of these reactions suggested common exposure to a widely distributed health-care product. They named heparin as a possible culprit and asked readers to send reports to their local or state health department. By February 11, heparin had been identified as the most likely culprit, and the manufacturer had halted production. A definitive scientific description of the incident appeared in the *New England Journal of Medicine* on June 5, 2008 (27).

In the Internet age, the information gap between immediate announcement of public health events by the news media and publication in medical journals is narrowing. *MMWR*'s "filling the gap" function can be done now in several ways. During the recent pandemic of 2009 influenza A (H1N1), CDC programs relied heavily on publication in *MMWR*, and 45 reports on the pandemic appeared in its pages through the end of 2010. However, to an unprecedented degree, CDC also relied on informal postings on the Web and direct releases to the media to convey a large amount of scientific information to health departments and the public. In addition, medical journals were much quicker about publishing fresh results. Soon after the outbreak was recognized, the *New England Journal of Medicine* published information about the epidemiology of the newly characterized disease within just a few days after data collection (28). Many other publications posted electronic journal articles within just days of submission. In addition, other informal methods of communication have come to

the fore (e.g., PLoS Currents).

In the last few years, the Internet has revolutionized medical publishing. Old medical journals are now questioning their business models, especially models that rely on printing on paper. The extent to which this publishing maelstrom will affect *MMWR* is uncertain. Certainly, some of the scientific functions of *MMWR* cannot be supplanted by informal posting on the Web. *CDC Surveillance Summaries* and vaccine recommendations must maintain a minimum level of formality to be considered credible and generally that includes formal indexing in MEDLINE, a step that makes them part of the medical literature. That need suggests they will be published in *MMWR* for a long time to come, but even that is uncertain. Already, some traditional *MMWR* contributors, faced with pressure to publish material more quickly and less expensively, have elected to simply post materials on the Web rather than submit them for formal editing, publication, and indexing.

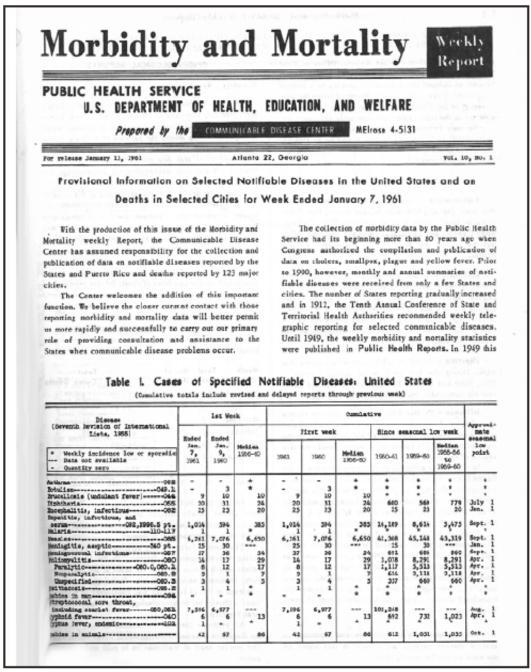
Over the past 50 years, *MMWR* has changed as CDC's mission has changed and as successive generations of *MMWR* authors, editors and staff members have carried it forward. One tribute to *MMWR*'s continued vitality is the growing desire of many other nations to have their own *MMWR*-like publications, and *MMWR* editors often give advice on this to foreign ministries of health. Many people---readers, staff members, and friends---have come to love the little publication that has done so much for public health over so long, and they now worry about its fate in the modern-day publishing maelstrom. Perhaps all should recall the many times in the past 50 years when upheavals in public health, technology, and publishing seemed to spell trouble for *MMWR*, but through it all, *MMWR* adapted, persevered, and flourished.

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- * Editor, MMWR, 2007--2010.
- † See http://www.cdc.gov/mmwr/mmwrpodcasts.html.
- § For a time, MMWR also was reprinted by the Ochsner Clinic.
- ¶ In 2010, MMWR established a Facebook page on which readers can comment on MMWR articles; so far, this page has been used almost entirely by lay readers rather than by MMWR's scientific audience.

FIGURE 1. Facsimile of the first issue of $\it MMWR$ published at CDC, January 13, 1961



Alternate Text: The figure presents the cover of the first issue of MMWR published at CDC on January 13, 1961.

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