

A Profile of the Medicare Current Beneficiary Survey

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This article presents the logic, methods, and capabilities of a major new source of data on the Medicare population, the Medicare Current Beneficiary Survey (MCBS). The survey originated from the need to provide valid estimates of various kinds of health care spending, such as long-term care spending or expenditures by different age groups, to describe the effects of the Medicare program on its beneficiaries, and to model the effects of proposed program changes.

Presented here is an account of the MCBS sampling and data collection design and the analytic strengths of the resulting data. Of special interest are the use of Computer-Assisted Personal Interviewing (CAPI); sampling from Medicare enrollment files; design for both cross-sectional and longitudinal analysis; surveying both community and facility residents; and merging survey and administrative data.

DESIGN OF THE MCBS

The MCBS is a continuous, multi-purpose survey of a representative sample of the Medicare population, conducted by the Office of the Actuary, Health Care Financing Administration (HCFA) through a contract with Westat, Inc. Development of the MCBS is built on an extensive body of experience in government health surveys, including the Current Medicare Survey and the National Medical Expenditure Survey. The Survey of Income and Program Participation served as a model for longitudinal design and analysis. For a comparative review of these surveys, see Corder and Manton (1991).

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The central goals of the MCBS are to determine sources of payment for all services used by Medicare beneficiaries, including copayments, deductibles, and non-covered services; to ascertain all types of health insurance coverage and relate coverage to sources of payment; and to trace processes over time, such as changes in health status, spending down to Medicaid eligibility, and the impacts of program changes.

The MCBS is unique in covering the entire Medicare population, whether aged or disabled, living in the community or in institutions; oversampling significant sub-populations; and following and reinterviewing the sample to obtain a continuous longitudinal picture. Other features cover collecting a wide variety of data on each sample person, including special supplements; combining survey and administrative data; and being able to retrieve data on timely issues. Sampled beneficiaries (or appropriate proxies) are interviewed in person three times a year. The first round of interviewing was conducted from September through December 1991. The data are designed to support both cross-sectional and longitudinal analyses.

MCBS Sample

The sample for the MCBS was drawn from HCFA's Medicare enrollment file (Hatten, 1980; Apodaca et al., 1992). The MCBS was able to draw an oversample of the disabled (under 65 years of age) and the oldest-old (85 years of age or over) because date of birth is recorded on the enrollment file. Medicare enrollment files also provided

Table 1

Medicare Current Beneficiary Survey (MCBS) Round 1 Sample, by Age: September-December 1991

Age	Medicare Eligibles July 1, 1991 (in Thousands)	Round 1 Completed Interviews	Interview Rate per Million Eligibles	Interviewing Ratio ¹
Total	34,601	12,674	366	1.00
0-44 Years	1,200	1,087	906	2.48
45-64 Years	2,170	1,095	505	1.38
65-69 Years	9,612	2,296	239	0.65
70-74 Years	8,097	2,113	261	0.71
75-79 Years	6,125	2,096	342	0.93
80-84 Years	4,032	2,050	508	1.39
85 Years or Over	3,365	1,937	576	1.57

¹Interview rate for the subgroup is compared with the rate for the entire sample. This shows the degree of overrepresentation in the sample of the youngest and oldest age groups.

SOURCE: Health Care Financing Administration, Office of the Actuary: Data from the MCBS files.

mailing addresses for the sample. Newly eligible beneficiaries are added to the sample once a year; deaths in the sample are handled by interviewing next of kin as proxies.

Medicare files allow supplementation of the interview data in important ways. Some data that are routinely available from Medicare claims files, such as diagnoses, procedures, and covered charges, need not be requested in the interview but can be included later (though there is some overlap for purposes of validation). Data for non-respondents to the interview are also obtainable from the files, so that characteristics of persons who refused to be interviewed, or could not be located, can be compared with those who completed the interview and used to adjust weighting.

The first stage of sampling was the selection of 107 geographic primary sampling units (PSUs), consisting of counties or groups of counties chosen to represent the Nation. PSUs are used in national surveys to reduce costs of traveling for interviews while maintaining national representation. Several PSUs were added or replaced so that the MCBS would better represent those areas of the Nation—primarily Western and Southwestern—that had experienced major growth in their 65 years of age or over populations since the 1980 census. Puerto Rico was included in the list in response to Government specifications.

Within PSUs, the sample was restricted to addresses within certain geographic subareas corresponding to postal ZIP Codes. The purpose of this restriction was to further economize on interviewer travel while maintaining a representative sample. A total of 1,163 such sub-PSU areas were selected for the initial sample, with probability proportionate to size using systematic sampling.

Beneficiaries residing in these areas were selected for the sample by systematic random sampling within age strata. Sampling rates varied by age (0-44, 45-64, 65-69, 70-74, 75-79, 80-84, and 85 or over) in order to overrepresent the disabled (under 65 years of age) and the oldest-old (85 years of age or over). Given the sample size of about 12,000 persons permitted by the budget, allocation by age allows analyses by gender, region, and metropolitan versus non-metropolitan areas, but data for finer subgroups, such as elderly black and Hispanic people, are subject to substantial sampling errors. Table 1 shows the number and proportions of completed Round 1 interviews for each age stratum.

A key feature of the MCBS design is that sample persons are followed wherever they reside, including movement into and out of long-term care. Although the interviews are tailored to each of these two settings, they share a common core. A sample person who

is in the community for part of the reference period and in a nursing home for another part will essentially receive two interviews: one in the home for the community portion and the other with the facility staff. Thus, the survey accounts for utilization of care during the entire time in the reference period, typically the 4 months since the last interview.

One sample is used for both community and institutional beneficiaries, without drawing a separate institutional sample. It was calculated that a uniform procedure, with facility residents identified only at the time that interviewers located the sample persons, would yield about 1,000 institutional residents in each round, with others entering and leaving these settings over time. The actual numbers of beneficiary interviews completed in institutions were 942 in Round 1, 987 in Round 2, and 961 in Round 3. The sample is replenished annually, starting in the September-December round. This supplementary sample brings in newly eligible Medicare beneficiaries, replenishes sample cells depleted by refusals and death, and corrects for coverage errors in the initial sample frame. The first supplementary sample, fielded at Round 4 (September 1992), included 2,366 new sample members, 48 percent of whom were new beneficiaries, 42 percent who were replacements for attrition, and 8 percent who had addresses in ZIP Codes that were inadvertently omitted from the initial sample frame. Of the total, 379 were disabled and 1,987 were aged.

SURVEY INTERVIEW PROCESS

Community Interview

Interviews with sampled persons who are living in the community are designed to yield longitudinal series of data on the use of health services, medical care expenditures, health insurance coverage, sources of payment (public and private, including

out-of-pocket payments), health status and functioning, and a variety of demographic and behavioral information, such as income, assets, living arrangements, family supports, and access to medical care. An effort is made to interview the sampled person directly, but if the person is unable to answer the questions, he or she is asked to designate a proxy respondent, usually a family member or close acquaintance who is familiar with his or her care. In Round 1, 11 percent of the community interviews were done with proxies.

The typical MCBS interview lasts 1 hour, but there is considerable variation. Not all sections of the questionnaire are asked every time (Table 2). Round 1 includes a brief section on utilization, but focuses on demographic information, insurance coverage, health status, and access to and satisfaction with care. A core of questions designed to obtain detailed information on service utilization, charges, and payments begins in Round 2. Supplementary items are included in each round to address special topics.

The Round 1 questionnaire, fielded in September 1991, introduced the respondents to the survey but did not include the detailed questions about use and expenditures for care that are asked in each subsequent round. During the first interview, respondents are provided with a calendar to record details of health care use. They are encouraged to collect their Medicare and insurance statements, supporting bills, receipts, and prescriptions in preparation for the next interview.

The actual collection of detailed health care use and expenditure data began in Round 2 (January-April 1992). In this and subsequent rounds of the survey, respondents are asked about health care events, charges, and payments since the previous interview. As a result, a definite boundary is established for the recall of

Table 2
Medicare Current Beneficiary Survey (MCBS) Questionnaire Segments, Community Interviews:
Rounds 1-7

Segment	Round						
	1 December 1991	2 April 1992	3 August 1992	4 December 1992	5 April 1993	6 August 1993	7 December 1993
Introduction							
Name, Address, Age ¹	x	x	x	x	x	x	x
Demographics and Income	x	—	—	—	—	—	—
Household Enumeration ¹	x	x	x	x	x	x	x
Health Insurance Coverage ¹	x	x	x	x	x	x	x
Utilization							
Utilization Summary	—	—	x	x	x	x	x
Dental	—	x	x	x	x	x	x
Emergency Room	—	x	x	x	x	x	x
Inpatient Hospital	—	x	x	x	x	x	x
Institutional	—	x	x	x	x	x	x
Outpatient	—	x	x	x	x	x	x
Home Health	—	x	x	x	x	x	x
Medical Provider	—	x	x	x	x	x	x
Other Medical	—	x	x	x	x	x	x
Prescribed Medicines	—	x	x	x	x	x	x
Charges							
Statement Series	—	x	x	x	x	x	x
No-Statement Series	—	x	x	x	x	x	x
Charge and Payment Summary	—	—	x	x	x	x	x
Supplements							
Income and Assets	—	—	x	—	—	x	—
Health Status and Functioning	x	—	—	x	—	—	x
Provider Probes	x	—	—	—	—	—	—
Access to Medical Care	x	—	—	x	—	—	x
Satisfaction with Care	x	—	—	x	—	—	x
Usual Source of Care	x	—	—	x	—	—	x
Sources of Information	—	x	—	—	x	—	—
Qualified Medicare Beneficiary ²	—	—	—	—	x	—	—
Closing							
	x	x	x	x	x	x	x

¹After Round 1, these sections consist primarily of updates of the previous round's information.

²The Qualified Medicare Beneficiary program provides coverage of premiums, copayments, and deductibles to low-income elderly.

NOTE: X indicates that the section is present in a given round of interviewing.

SOURCE: Health Care Financing Administration, Office of the Actuary: Data from the MCBS files.

health care events. The calendar and accumulated insurance statements and receipts are reviewed as part of the interview. For each episode of health care, respondents are asked what charges were billed, who paid them, and what additional bills are expected. Medicare benefit statements (known as Explanation of Medicare Benefits) and any bills, insurance statements, checks, and receipts serve as the framework for collecting charge and payment data. Statements anchor events in time better than recall alone; they also

provide claim numbers for later computer linkage to the Medicare files. Anticipated statements and insurance payments not yet received are captured in the next round's summary review. Any gaps or visits for which statements are not available (and not expected) are filled by conventional survey questions.

In Round 3 (May-August 1992) and after, a summary of health care events recorded in the previous round is reviewed by the interviewer and respondent together. The summary review establishes a boundary

for reporting new events, probes for changes in household composition or insurance coverage, and prompts for missing information about old events.

Facility Interview

The MCBS conducts interviews for persons in long-term care facilities using a similar but shortened instrument. The initial contact for the facility interview is always with the facility administrator. Interviews are subsequently conducted with staff members designated by the director as the most appropriate to answer each section of the questionnaire. It was decided early in the design of the study not to attempt facility interviews with the sample person or family members. The facility questionnaire includes health status, residence history, insurance coverage, and the use and cost of services, but it does not include the attitudinal or other subjective items asked of community respondents.

Role of CAPI

The community interview, which constitutes more than 90 percent of MCBS data, is conducted using a computerized questionnaire on a notebook-size personal computer. The MCBS is one of the first surveys to use CAPI extensively. The decision to use this new technology was made early in the planning process in order to make the complex survey questionnaire easier to administer, to improve the accuracy of the data, and to make the data available for analysis quickly.

CAPI affects the survey in numerous ways, some expected and some not (Sperry, 1991; Edwards et al., 1992; Dulaney, Vincent, and Rhoads, 1992; Edwards, Sperry, and Edwards, 1992). CAPI greatly increases the efficiency of the questionnaire during the interview in the following ways:

- CAPI tailors the sequence of questions to the responses of the interviewee, resulting in few—if any—interviewer skip errors. The natural flow of the interview is maintained even when the pattern of questions is complex.
- CAPI automatically provides "fills," or word choices within questions. One keystroke can insert "you," "he," or "she," as appropriate, for the duration of the interview. The sample person's name, date of the last interview, and other items can also be filled as needed.
- CAPI maintains rosters or lists created during the interview, such as household members, health insurance plans, medical conditions, providers, visit dates, prescription drugs, and people who help with daily activities. These rosters can be used to structure questions, e.g., cycling through a series of doctor visits and checking for missing information. Interviewers can select items from a roster, add items, or correct them. Rosters are carried over from one interview to the next.
- CAPI edits entries for range and consistency. Corrections can be made immediately by the interviewer. Information missing from a previous round can be inserted in the questionnaire.
- CAPI allows instantaneous calculations to be made, such as the amount remaining to be paid on a medical bill after totaling several payments.
- Interviewers use the computer to electronically transmit completed cases to the central office over the telephone.

Concerns that CAPI would cause respondents to refuse or object to the interview, or that interviewers would have difficulties handling the computer were found to be groundless in the pilot test. For most interviewers, any hesitancy to rely on the

advanced technology of the survey was outweighed by the satisfaction and prestige of mastering it.

CAPI also has strategic implications for survey design and planning, some of which are not easily predicted. First, the MCBS took a year of intense activity from contract award to the start of pretesting of the CAPI questionnaire, largely because of the complexity of the instrument. The length of the MCBS development phase was due more to the instrument's complexity and the length of the clearance process than any difficulties inherent in CAPI. CAPI strongly influences the shape of the questionnaire itself: It can be more complex, more tailored to the characteristics of respondents, with more cross-references and rosters, and have more error checks.

Finally, the speed of data delivery through CAPI is unprecedented for a large survey: By the end of the 4-month field period of Round 1, 75 percent of the data on the cases had been delivered to HCFA.

MCBS IN THE FIELD

A pilot study for the MCBS, conducted during the first half of 1991, confirmed the viability of the basic design. In particular, the issues of the acceptance of CAPI and a lengthy instrument by both respondents and interviewers were answered favorably.

Bills, statements, and calendars proved useful in collecting charge and payment data. CAPI worked—both hardware and software—though not without corrections.

The main results of the pilot were to give insights into the kinds of training needed to prepare interviewers to use CAPI and to account for charges and payments. The pilot also confirmed the importance of the calendar for improving the reporting of events, and led to improvements in the statement series.

For the actual data collection, which began in September 1991, MCBS took a number of steps to ensure data quality:

- Training and retraining interviewers in the special demands of the survey, such as analyzing insurance statements, apportioning payments, and dealing with the stresses of interviewing the chronically ill.
- Providing on-the-spot error checks through CAPI.
- Including summaries of previous responses in the interview.
- Providing a Spanish translation, accessible in CAPI.
- Giving respondents a calendar to maintain a record of health care use, and tokens of appreciation, such as certificates and birthday cards.
- Allowing the use of proxy respondents, under specific rules and with authorization by the sample person.
- Installing a toll-free telephone line for respondent questions.
- Monitoring HCFA administrative files for deaths and changes of address.

Response rates for each of the first four rounds are presented in Table 3. For the continuing sample, the cross-sectional response rate thus rose to 97.3 percent in Round 4. For the 2,366 persons added to the sample in Round 4, the response rate was 84.3 percent, comparable with the response of the original sample in Round 1. Refusals declined as a percent of eligibles from 9.6 percent in Round 1 to 4.8 percent in Round 2, 1.6 percent in Round 3, and 2.2 percent in Round 4.

By the end of Round 3, 11,355 sampled persons had 3 complete rounds of interviewing, 78.0 percent of the 14,530 originally eligible. Another 503 had partially completed the 3 rounds, raising the total response rate to 81.6 percent. Based on preliminary

Table 3
Medicare Current Beneficiary Survey (MCBS) Cross-Sectional Response Rates, by
Rounds 1-4

Response Summary	Round				Round 4 Supplementary Sample ¹
	1	2	3	4	
Eligible Respondents	14,530	12,553	11,566	10,895	2,366
Completed Interviews	12,674	11,736	11,064	10,605	1,995
Response Rate (Percent)	87.2	93.5	95.7	97.3	84.3

¹2,366 persons added to the Round 4 survey sample.

NOTE: The number of persons eligible for Rounds 2, 3, and 4 is less than the number who completed the preceding round because of deaths during the earlier round.

SOURCE: Health Care Financing Administration, Office of the Actuary. Data from the MCBS files.

Round 4 refusals, the longitudinal response rate including completes and partial completes at the end of Round 4 will approximate 77 percent. The institution of overlapping rotating samples for fixed periods each (i.e., dropping one-third of the sample each year and adding an equivalent number of new sample members) is planned beginning in Round 13 as the best way to keep the sample current and unbiased.

DATA PREPARATION

Data sent electronically by the interviewers are received by microcomputers in Westat's headquarters and transported to VAX minicomputers. As mentioned previously, many of the edits are performed by the CAPI program as the responses are collected. Most of these are logical checks, ensuring that answers to questions are consistent with each other (e.g., a person described as a "son" must be male; the waiting time during an office visit must not be longer than the total time of the visit). Other edits check for correct links between segments of the data base. Errors remaining when the data are reviewed in the central office are examined in the edit shop, which employs about nine full-time staff members for the community and three for the facility questionnaires. The editors spend most of their time on non-automated aspects of editing, such as

reviewing interviewer comments and making complex corrections in the data base.

Estimation

The estimation program has two major parts. The first is a set of general purpose small weights that reflect the probabilities of selection for the sample, adjusted for under-coverage and non-response. The weights have also been adjusted to reflect the July 1, 1992, Medicare enrollment by age and gender. The general purpose weights can be used for most round and annual tables and are part of the public use files.

The second part of the estimation program is a set of replicated weights (using balanced repeated half samples) that are appropriate to calculate variances for data elements collected in a sample with a complex cluster design such as that of the MCBS. These replicate weights are calculated so that users may compute their own standard errors for MCBS variables. These weights are not part of the public use files but are available from HCFA

Data linkage

MCBS interview data have been linked to Medicare claims and other administrative data to enhance their analytic power. This results in a data base combining data that can be obtained only from personal

interviews with Medicare administrative data. The survey data and Medicare claims data together constitute a more complete data set for the MCBS sample than is available from either source. Administrative data, such as buy-in status and capitated plan membership, are also added to the file. The final file consists of survey, administrative, and claims data. All personal identifying information is removed.

MCBS PRODUCTS

Public-use data tapes are issued on a calendar year basis. The first tape, for calendar year 1991, includes Round 1 baseline interviews (September-December 1991) and has Medicare claims for all of 1991 for these beneficiaries. These data were released to the public through the National Technical Information Service in January 1993, about 12 months after the end of field work for that round.

As previously noted, Round 1 introduces the respondents to the survey, and does not contain information on utilization and costs. It does, however, contain valuable information on the characteristics of the sample, health insurance coverage, health status, and access to and satisfaction with care, as well as Medicare claims for all of 1991.

Release of this file was followed in May 1993 by the release of a file containing the income and assets supplement from Round 3, including imputations and weights. This file is designed to be merged with the information on the Round 1 file for analysis.

The third file that was released (October 1993) contains data from Round 4, i.e., interviews conducted during September through December 1992. This file is similar to the Round 1 public-use file: Claims for the year are appended but not matched to interview data; cost and utilization data from the survey are not included; and no

new imputations have been done. Cross-sectional and longitudinal weights are included. This release is of special interest because it permits before-and-after comparisons (Rounds 1 and 4) of health status and functioning, access to care, satisfaction with care, and usual source of care.

The 1992 Fully Linked public-use file, expected late in 1994, will be the first complete annual file. It will contain all survey data for services obtained during calendar year 1992, and thus include not only Round 2-4 interviews, but also those data from Rounds 5 and 6 that refer to 1992. Medicare claims for 1992 services will be matched to events reported in the survey. Imputations will be done after this matching. Cross-sectional and longitudinal weights will be included.

USES OF MCBS DATA

The MCBS monitors the effects of recent changes to the Medicare program and provides the basic information needed to estimate the cost of program changes and expansions, including the effects of wider system reforms on the Medicare population (Stone, 1993). Most of the potential of the MCBS data remains to be tapped because the data are so new. However, indicated here are some important uses of the MCBS data for policy analysis, including some work in progress.

Effects of Payment Reform

MCBS data will be used to assess the effects of Medicare physician payment reform on access to and costs of care. This use was built into the Round 1 and Round 4 supplements on access and satisfaction at the request of the Physician Payment Review Commission (1994). Access is also being studied by the Center for Health

Economics Research under a HCFA contract (Health Care Financing Administration, 1993; Gornick, 1993). Specific attention can be paid to subpopulations vulnerable to loss of access under the new fee schedule. Any effects of the payment reforms on service use and expenditures, especially the portion paid by beneficiaries themselves, can be monitored through the MCBS.

Near-Poor

The MCBS is well suited to examine health care use and expenditures by the near-poor elderly, who are not eligible for Medicaid and relatively unprotected against increasing health care costs. Some relief is offered by the recent Qualified Medicare Beneficiary (QMB) program, under which some low-income elderly are eligible for coverage of Medicare premiums, copayments, and deductibles. Evaluation of the QMB program, especially the gap between potential and actual enrollment, is a topic in Round 5 of the MCBS. These data are being analyzed by the staff of Project HOPE under a HCFA grant. The MCBS sample also allows the analysis of differences in utilization by near-poor elderly of different races, and the extent to which the near-poor spend down to Medicaid in the community.

Medicare Supplementary Insurance

A further field for evaluation is the effect of medigap reforms instituted by the Omnibus Budget Reconciliation Act (OBRA) of 1990. Under OBRA 1990, insurers have to offer policies which conform to 1 of 10 prototype benefit packages (Rice and Thomas, 1992). Data from the MCBS will show not only changes in insurance coverage, but differences in payment sources before and after implementation of the law. A related topic of investigation is the distribution of supplementary

insurance coverage among different types of beneficiaries and its effect on Medicare utilization (Chulis et al., 1993a, 1993b).

Care for Non-Elderly Medicare Beneficiaries

MCBS is one of the few data sources that includes people eligible for Medicare by virtue of disability. The needs, use and cost, payment, and access issues for this subpopulation are relatively unexplored. MCBS will not only provide a cross-sectional portrait of the Medicare disabled, but will track them over time to determine the effects of reform initiatives.

Modeling and Monitoring System Reforms

MCBS provides an opportunity to simulate the effects on the Medicare population of implementing managed competition or other reforms of health care financing and delivery. The size of the sample and the richness of the data permit analysis of subgroups that are currently experiencing elements of managed care. Once a health system reform is in place, MCBS permits monitoring and evaluation of its effects on the current Medicare population, e.g., how an income-related deductible would affect program outlays and beneficiary burden; what the program cost to cover prescription drugs, long-term care, and other services not presently covered by Medicare would be; and how such changes would affect other payers, such as Medicaid and private insurers.

Retiree Health Benefits

MCBS includes all sources of financing of care, including private insurance based on previous employment. There is considerable concern that employers are reducing retiree health benefit programs in

response to economic problems as well as to stricter accounting rules. MCBS can describe the current role of retiree health benefits in financing care and monitor changes in the scope of retiree benefits.

Long-Term Care

Because it follows Medicare beneficiaries through careers that include institutional residence, MCBS is an important resource for studying the transition to long-term care. Again, any proposed changes to long-term care financing can be modeled using MCBS data, and actual changes can be monitored and evaluated. Duke University's Center for Demographic Studies is conducting grade-of-membership studies under a HCFA contract to establish typologies of Medicare beneficiaries with respect to need for long-term care. The Urban Institute is using the MCBS data to study sources of nursing home payments under a HCFA contract.

Drug Costs

MCBS collects extensive data on prescription drug use, costs, and payments in the Medicare population. Many gaps in drug data that led to the creation of the MCBS can now be filled with MCBS data.

CONCLUSION

The MCBS represents a major commitment by the U.S. Department of Health and Human Services to provide the tools for policy research on the Medicare population. Advantages of this survey include its large and comprehensive sample of the Medicare population; repeated interviews of a continuous sample; breadth of information included in the questionnaire; thorough analysis of use, cost, and financing of medical care; use of computers to improve data quality; and speed of delivery of the data.

ACKNOWLEDGMENTS

Thanks are due to the following colleagues for their aid in fitting together the pieces of this profile: Ross Arnett, Barbara Brunstetter, George Chulis, Frank Eppig, Dave Gibson, Mary Hogan, Carolyn Rimes, Kim Skellan, Dan Waldo, Rick Apodaca, Debbie Bittner, Brad Edwards, Sherm Edwards, Dave Judkins, Sandra Sperry, Michele Adler, Dan Kasprzyk, and Robyn Stone.

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