



JAPAN: Digitization of MCH Handbook and the socioeconomic disparity in health

Digitizing the Maternal and Child Health Handbook

The Japanese government is currently working to establish an agency for children and families by as early as 2023, dedicated to systematically fulfilling the needs of children and their families. This will integrate governmental programs for children that are currently dispersed across various agencies (e.g., educational programs and health screening at schools are overseen by the Ministry of Education, Culture, Sports, Science and Technology, child poverty is overseen by the Cabinet Office, and child health care and child abuse prevention are overseen by the Ministry of Health, Labour and Welfare) into one. Japan will take a major step toward establishing a comprehensive database for the health and development of children across the life course.

The integration of children's data could also mean a step toward the digitization of the Maternal and Child Health (MCH) Handbook, as a means of directly empowering mothers and children on their health and development based on the most up-to-date data available. Though the implementation of the digitized MCH Handbook is currently limited to selected municipalities in Japan, the Japanese government is currently working to create an electronic personal health record system using the recently introduced "My Number" system, which is a social security system that allocates one unique number to all registered residents in Japan. The digitization of the MCH Handbook, along with the creation of a comprehensive database for the health and development of children across the

life course, could better support the lives of children through comprehensive continuum of care, stronger empowerment of children and their mothers, precision medicine, and personalized policy for children. With the likely imminent digitization of the MCH Handbook, there is a growing need to answer the question, what do policymakers need to be aware of in the digitization of the MCH Handbook?

Study on the attitudes of mothers and pregnant women toward the digitization of the MCH Handbook

In a recent study, we investigated the attitudes of mothers and pregnant women toward digitization of the MCH Handbook in Japan using a cross-sectional survey. Here, we will briefly describe our methods and findings, and would like to refer the reader to the original research article for details on our research. We obtained data from a total of 7,710 mothers and pregnant women. We first explored sociodemographic factors associated with favorable opinions toward digitization using a multivariate regression model, and found that higher income and educational levels, older age, and less reliance on the paper MCH Handbook were significantly associated with favorable opinions toward digitization. We then grouped the participants using partitioning around medoids clustering, a machine-learning approach, to interpret their varying attitudes toward digitization in light of their sociodemographic characteristics as well as their affinity toward the paper MCH Handbook. We were able to group the mothers and pregnant women into four clusters (Table 1). The cluster with the highest



Maternal and Child Health Handbook, Hachioji city, Japan, 2022



A digital personal health record is used to complement a paper MCH Handbook for checking the immunization schedule.

socioeconomic status (SES) (Cluster 2) was the most favorable toward digitization, while two clusters with the lowest SES (Clusters 3 and 4), one of which relied heavily on the paper MCH Handbook (Cluster 3), were less favorable of digitization compared to the high SES cluster. The final cluster was comprised of mothers with the experience of raising multiple children and did not rely heavily on the MCH Handbook (Cluster 1).

The digital divide and social determinants of maternal and child health

In our study, we found that mothers and pregnant women of lower SES may be less likely to adopt digital health technologies and may instead be dependent on the conventional paper MCH Handbook. Additionally, the present study sheds light on a major challenge faced by personal health records (PHRs): the most difficult for PHRs to reach tend to be those who are socioeconomically most vulnerable. Our findings indicate that low SES can be a major barrier in the uptake of digitized health interventions. In such a case, the digital divide, which refers to the inequity in access to information and communications technologies, could worsen socioeconomic disparities in health. With many mothers dependent on the MCH Handbook for health

information from pregnancy to their children's adolescence, a careless digitization of the MCH Handbook without retaining the paper MCH Handbook may marginalize mothers and pregnant women of lower SES. Perhaps the most appropriate option when digitizing the MCH Handbook may be to leave the paper MCH Handbook in place, leaving both options available, until policymakers are sure that the new digitized MCH Handbook is inclusive of the most vulnerable populations.

That said, we do not wish to undermine the importance of creating a readily-available digital PHR that is easier for many mothers to access than its paper-based counterpart, as well as the value of constructing a database that longitudinally tracks various aspects of a child's life, including education, health, disease prevention, and sociodemographic factors. Such innovations are essential in promoting continuum of care, empowerment, precision medicine, personalized policy, and support for vulnerable populations. However, our findings underscore the importance of careful dissemination and implementation of a digitized MCH Handbook. Implementation should be inclusive, covering mothers and children from all demographic backgrounds, including the poor and the less educated, among others.

▼ Table 1. Results of the clustering analysis.

| | Cluster 1 n=2258 | Cluster 2 n=2051 | Cluster 3 n=1979 | Cluster 4 n=1422 |
|---------------------------------------|---------------------|---------------------|---------------------|---------------------|
| Favorable toward digitization | 2.3% | 5.5% | 1.9% | 3.9% |
| Ambivalent toward digitization | 66.8% | 73.3% | 66.3% | 67.2% |
| Unfavorable toward digitization | 30.9% | 21.2% | 31.7% | 28.9% |
| Read almost all of paper MCH Handbook | 27.5% | 0.4% | 50.3% | 0% |
| Number of children [mean ± SD] | 2.43 ± 0.74 | 1.09 ± 0.29 | 1.11 ± 0.33 | 1.08 ± 0.27 |
| Lowest income quintile | 3.2% | 0.0% | 5.4% | 5.8% |
| High school graduate or less | 31.8% | 3.7% | 28.2% | 35.1% |

* Clusters were identified via partitioning around medoids clustering [Goto R, et al. (2021)]. Some variables were represented differently from the original study for better interpretability.

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Further readings:

1. Goto R, et al. Can digital health technologies exacerbate the health gap? A clustering analysis of mothers' opinions toward digitizing the maternal and child health handbook. *SSM-population health*. 2021 Dec 1;16:100935.