



August 31, 2022

Chiquita Brooks-LaSure
Administrator
Centers for Medicare & Medicaid Services
Department of Health and Human Services
Attn: CMS-4203-NC
7500 Security Boulevard
Baltimore, MD 21244-1850

Re: Medicare Program; Request for Information on Medicare (CMS-4203-NC)

Dear Administrator Brooks-LaSure:

The Personalized Medicine Coalition (PMC), a multi-stakeholder group comprising more than 220 institutions from across the health care spectrum, thanks the Centers for Medicare & Medicaid Services (CMS) for the opportunity to submit comments on the agency's request for information about the Medicare Advantage (MA) program.ⁱ In the following comments, we identify opportunities for improvement in the MA program to accelerate patient access to personalized medicine and improve health care for Medicare beneficiaries.

PMC defines personalized medicine as an evolving field in which physicians use diagnostic tests to determine which medical treatments will work best for each patient or use medical interventions to alter molecular mechanisms that impact health. By combining data from diagnostic tests with an individual's medical history, circumstances, and values, health care providers can develop targeted treatment and prevention plans with their patients.

Personalized medicine is helping to shift the patient and provider experiences away from trial-and-error toward a more streamlined process for making clinical decisions, which will lead to improved patient outcomes, a reduction in unnecessary treatment costs, and better patient and provider satisfaction. PMC's members are leading the way in personalized medicine and recommend that patients who may benefit from this approach undergo appropriate testing and tailored treatment as soon as possible during their clinical experiences.

MA plans offer Medicare beneficiaries an alternative to original Medicare through a private sector payer. Changes to the MA program should enhance patient access to personalized medicine, which has the potential to improve outcomes for patients and reduce costs to the health care system. We believe this approach aligns with CMS' *Visions for Medicare and Strategic Pillars*, which include driving innovation to tackle health system challenges and promoting value-based, person-centered care.ⁱⁱ Making improvements now is critical, as the number of beneficiaries enrolled in MA is expected to surpass original Medicare by 2023ⁱⁱⁱ and reach 69 percent of the Medicare

BOARD OF DIRECTORS

President
Edward Abrahams, Ph.D.

Chair
Jay G. Wohlgemuth, M.D.
Quest Diagnostics

Vice Chair
William S. Dalton, Ph.D., M.D.
M2Gen

Treasurer
Mark P. Stevenson, M.B.A.
Thermo Fisher Scientific (former)

Secretary
Michael S. Sherman
Point32Health

Bonnie J. Addario
GO₂ Foundation for Lung Cancer

Antonio L. Andreu, M.D., Ph.D.
EATRIS

Randy Burkholder
PhRMA

Kevin Conroy
Exact Sciences

Stephen L. Eck, M.D., Ph.D.
MacroGenics

Lori Frank, Ph.D.
Alzheimer's Foundation of America

Brad Gray
NanoString Technologies

Kris Joshi, Ph.D.
Change Healthcare

Richard Knight
American Association of Kidney Patients

Peter Maag, Ph.D.
CareDx

Anne-Marie Martin, Ph.D.
GlaxoSmithKline

J. Brian Munroe
Bausch Health Companies

Lincoln Nadauld, M.D., Ph.D.
Intermountain Healthcare

Elizabeth O'Day, Ph.D.
Olaris, Inc.

Kimberly J. Popovits

Hakan Sakul, Ph.D.
Pfizer

Lauren Silvis
Tempus

Apostolia Tsimberidou, M.D., Ph.D.
MD Anderson Cancer Center

Michael J. Vasconcelles, M.D.
Flatiron Health

Werner Verbiest
Johnson & Johnson

population by the end of 2030.^{iv} We appreciate CMS' commitment to engagement with a variety of stakeholders through this request for information.

Statement of Neutrality

Many of PMC's members will present their own responses to this *Request for Information on Medicare* and will actively advocate for those positions. PMC's comments are designed to provide feedback so that the general concept of personalized medicine can advance, and are not intended to impact adversely the ability of individual PMC members, alone or in combination, to pursue separate comments with respect to this request for information.

Part A: Advancing Health Equity

- *Question 1: What steps should CMS take to better ensure that all MA enrollees receive the care they need?*
- *Question 2: What are examples of policies, programs, and innovations that can advance health equity in MA? How could CMS support the development and/or expansion of these efforts and what data could better inform this work?*

Delivering personalized medicine successfully depends on consideration of patients' biology, medical history, values and circumstances. Unfortunately, clinical care is too often delivered, and therapies prescribed, based on one-size-fits-all assumptions that do not account for the needs of underserved groups of patients or the underrepresentation of certain groups in medical research. Delivering care in this way risks disease progression and the exacerbation of health inequities. PMC appreciates CMS' request for information on how to enhance health equity for all enrollees through MA plans.

We encourage the agency to prioritize feedback received from commenters that work directly with disadvantaged and underserved groups of patients. PMC recently launched its own initiative to engage stakeholders from underserved communities to identify strategies for advancing health equity in personalized medicine. We look forward to sharing the results from this initiative in future comments as they relate to improving the agency's coverage and reimbursement policies.

CMS' *Framework for Health Equity* includes a priority for expanding the collection, reporting and analysis of standardized data, including demographic data, social determinants of health (SDOH) data, and patient-reported data, to increase the agency's understanding of beneficiaries' needs among underserved communities.^v Analysis of large datasets can contribute to understanding disparities in health care and health outcomes or to perpetuating them. Researchers and clinicians are aware that missing data, missing representation, and bias in care patterns impact recognition and treatment of disease in racial, ethnic, and gender minority populations. Missing data have often occurred due to misdirection of data collection and reporting obligations to indirect providers, such as laboratories, that typically have no direct patient contact and, therefore, have no direct access to the data being sought. Treatment providers, meanwhile, have direct access to the data being sought but may lack incentives for providing such data to laboratories and other indirect providers. These threats to the broad-based availability of data across

institutions could result in inequitable treatment recommendations and treatments, and are now being explicitly addressed in data management and research processes. Health information exchanges and real-world data (RWD) are actively seeking to capture elements of social determinants of health to better identify and reduce inequities in health and health outcomes.^{vi}

We encourage CMS to consider how to broadly leverage and improve the collection of RWD to help advance health equity in MA. Data collection using RWD could help provide a more comprehensive picture of personalized medicine access issues and assist CMS and MA plans in determining how to promote equity in access to personalized medicine. This includes, for example, understanding equitable access to biomarker testing strategies and targeted treatments, germline (testing for an inherited mutation) testing, and, in the case cancer, tumor profiling and minimal residual disease (MRD) tests. Equitable access to pharmacogenomic testing, discussed later in Section D of this letter, could also help drive forward medication management and prescribing informed by each patient’s genetics.

PMC’s report titled *Using Health Data to Advance Personalized Medicine: Challenges and a Path Forward* identified the need over the next three years for institutional and federal/state policies to align on accelerating the development and adoption of practices and standards for datasets created from real-world data.^{vii} PMC recognizes that a trusted and validated system of RWD is needed to support its integration as a mainstay of research and discovery. PMC also sees a need to engage patients in understanding and contributing to real-world datasets. RWD can be leveraged best to establish a secured and standards-based infrastructure for integration of clinical and non-clinical data resources such as social determinants of health data and remote patient monitoring. Research into the applications of RWD in clinical trials will be needed to validate algorithms to decrease the risk of known biases. RWD applications will also benefit from data sharing governance principles and best practices to ensure maximum use and benefit are achieved for those whom the data represents to avoid exploitation and misuse.

In addition to gathering SDOH information contributing to disparities in care, CMS could use patient satisfaction surveys to help gather data about who is receiving biomarker testing before cancer treatment, starting with CMMI’s Enhancing Oncology Model. Research conducted by PMC and others has identified an implementation gap whereby many patients with actionable mutations identified through next-generation sequencing (NGS)-based diagnostic testing do not transition to targeted treatment.^{viii} Using patient satisfaction surveys to develop a more comprehensive picture of personalized medicine access issues could promote equity in access to biomarker testing and targeted therapy. Addressing this implementation gap is key to delivering personalized medicine in cancer and aligns with other initiatives, including CMS’ proposed “Promoting Cancer Care MVP” and the Biden administration’s Cancer Moonshot. Surveys should be standardized, culturally appropriate and developed in collaboration with patient advocacy groups to make sure the terminology is appropriate for patients.

- *Question 10: How have MA plans and providers used algorithms to identify enrollees that need additional services or supports, such as care management or care coordination? Please describe prediction targets used by the algorithms to achieve this, such as expected future cost and/or utilization, whether such algorithms have been tested different kinds of differential treatments,*

impacts, or inequities, including racial bias, and if bias is identified, any steps taken to mitigate unjustified differential outcomes.

When applied effectively to electronic health record (EHR) data, artificial intelligence (AI) and machine learning (ML) solutions can offer powerful insights to guide the selection of patients who will benefit from specific interventions, thus improving the efficiency, effectiveness, and equity of care. Technical improvements could enable researchers to maximize the use of AI and ML to identify trends, connections, and factors influencing outcomes.

There is also a need for alignment of institutional and federal/state policies enabling researchers to acquire data and integrate it with biological information and clinical care records. There are risks to using RWD in lieu of more controlled clinical trial data. For example, in real-world datasets, it is difficult to tell if there has been accidental inclusion of extraneous data or if information is missing. ML and AI technology “learn” by analyzing data from human systems and existing treatment patterns, meaning an algorithm resulting from AI could perpetuate or exacerbate an inequity present in the underlying data. Transforming RWD into real-world evidence for research and/or regulatory purposes requires a multistep, rigorous approach. The development of scientific, operational, and technical best practices to ensure the integrity of data and analysis is needed to inform subsequent guidance regarding principles such as traceability to source, data quality, validation, transparency, and reproducibility.^{ix} **PMC appreciates CMS’ request for information from MA plans and providers on how to foster the use of and eliminate bias in algorithms used to identify patients who need additional services or support.** These technologies have the potential to transform patient care by enabling clinicians to better target, compare, and personalize interventions.

Part B: Expanding Access to Coverage and Care

- *Question 5: What role does telehealth play in providing access to care in MA? How could CMS advance equitable access to telehealth in MA?*

Despite the consensus that personalized medicine approaches have significant value, their implementation – and consequently patient access – across the United States is highly variable.^x Patients face many challenges in accessing personalized medicine and the appropriate testing services, ranging from coverage and reimbursement policies and socioeconomic determinants of health, to providers’ varying levels of expertise with genomics and with navigating related testing options for patients.^{xi} Telehealth can improve patients’ access to personalized medicine by making it easier for a patient to connect with a health care provider, including providers a patient would not normally have access to at their current health care institution, to discuss appropriate treatment and prevention options, which may involve diagnostic testing. For example, genetic tests used to assist in medication selection for patients with depression have demonstrated an earlier reduction in symptoms,^{xii} improved patient outcomes,^{xiii} and reduced costs.^{xiv} For patients with rare diseases, for example, it can take over a decade and visits with more than 16 specialists to obtain a correct diagnosis.^{xv}

According to a report released in December by the Department of Health and Human Services (HHS), the share of Medicare fee for service visits conducted via telehealth increased 63-fold, from approximately

840,000 to 52.7 million, between 2019 and 2020.^{xvi} Congress' temporary expansion of Medicare beneficiaries' access to telehealth services during the coronavirus public health emergency has played a critical role in ensuring the continuity of care for patients. Focusing specifically on screening for lung cancer, telehealth screenings were found to be just as effective as in-person screenings, and the use of telehealth during the COVID-19 pandemic preserved access to screening for a safety net hospital's large African American patient population.^{xvii}

PMC supports changes to Medicare, including for MA plans, that would permanently expand telehealth flexibilities after the public health emergency and remove Medicare's geographic and originating site restrictions, which require a patient to live in a rural area and be physically in a doctor's office or clinic to use telehealth services.

In addition, we would like to caution against a proposal circulated by MedPAC and in Congress that would require an ordering provider to have had a face-to-face encounter with a Medicare beneficiary within the past six-to-twelve months (or some other arbitrary period) before Medicare could pay a claim for reimbursement of a "high-cost laboratory test." By deeming certain tests — based simply on an arbitrary definition of high cost that in some proposals has been as low as \$142 — not reimbursable in conjunction with a telehealth encounter, this proposal has the potential to stifle patient access to personalized medicine under telehealth without effectively preventing the Medicare fraud and waste it is purportedly intended to address. Diagnostic tests, including the laboratory and genetic tests that would be impacted by this proposal, are the foundation for personalized medicine's approach to health care in cancers as well as some common chronic, mental health, rare and infectious diseases. As we have explained in previous comments to Congress and MedPAC,^{xviii} PMC is concerned by the potential impact this proposal would have on Medicare beneficiaries as well as laboratories.

Laboratories perform the tests ordered by providers, and once they have performed the test, they deserve to be paid for their work. Laboratories have no control over whether the patient had an in-person encounter at some point prior to the test order, and once the test order arrives with a specimen, they do not have the luxury of waiting to test the specimen until after confirmation of such an encounter has been obtained.

Discouraging the use of telehealth to facilitate access to medically necessary laboratory services, which such a proposal would do, is therefore inconsistent with the appropriate use of technology to improve health. This proposal could implicate laboratory tests ordered via telehealth in advance or in preparation for an in-person appointment if the patient had not seen the physician within the past six-to-twelve months but was planning to go in for a visit that had been scheduled in the near future. We understand that the rationale for this provision is to prevent fraud, but this provision would implicate more legitimate test orders than fraudulent ones, and Medicare has a whole host of other tools that can be and are used to identify and address fraud and abuse.

We are also concerned that any definition of "high-cost laboratory test" could be picked up and used in other contexts in ways that could limit patient access to personalized medicine.

Finally, there are a host of technical and operational problems this proposal would cause that could impede the delivery of personalized medicine to patients. If enacted, laboratories would likely bear the burden of audits and recoupments on the back end of the payment process, because it is unlikely that editing could be established that would stop these claims from being paid on the front end. This would create a significant burden for physicians who would face numerous lab requests for documentation of prior visits. Since it would not impact their reimbursement, physicians may also have no incentive to respond to such requests, and laboratories could run the risk of being unpaid for their services due to factors beyond their control. Furthermore, it would appear that the in-person visit within the period prior to the test order would have to be with the same provider who ordered the test, even though a prior visit — or even multiple prior visits — may have been with a different provider within the same practice. PMC believes there are better solutions to extend the benefits of telehealth without penalizing laboratories for offering high-value services.

Protecting the Medicare program and its beneficiaries from unnecessary spending and potential fraud is important, but not before promoting Medicare beneficiaries' access to high-quality, appropriate care. Imposing this requirement would create additional, unnecessary burdens on patients, and, thus, limit patient access to diagnostic tests underpinning personalized medicine, which can make health care more effective and efficient by guiding patients to the right treatments, sooner. PMC believes this requirement would thereby run counter to CMS' priorities under the Biden administration to advance health equity and patient-centered care.

- *Question 10: How do MA plans use utilization management techniques, such as prior authorization? What approaches do MA plans use to exempt certain clinicians or items and services from prior authorization requirements? What steps could CMS take to ensure utilization management does not adversely affect enrollees' access to medically necessary care?*

PMC shares concerns with the health care community that Medicare beneficiaries face more restricted access to health care under MA than under traditional Medicare due to utilization management tools, restrictive formularies, and denials for services. The number of medicines subject to utilization management in the commercial market and Medicare Part D has grown over time. A recent study from Avalere analyzing changes in the use of utilization management for single-source brand drugs in the commercial market found that prior authorization and step therapy increased for conditions such as cancer, cardiovascular agents, rheumatoid arthritis and diabetes from 2014 to 2020.^{xix} The Medicare Part D market has experienced similar trends in growth, where the average number of medicines covered by Part D plans that were subject to utilization management restrictions increased from 27 percent in 2010 to 47 percent in 2021.^{xx}

The application of utilization management restrictions also appear to vary wildly with the majority more stringent than clinical guidelines and FDA label indications. One recent study found that more than 80 percent of commercial health plans' step therapy policies for specialty medicines were more restrictive than the FDA labeling and more than half were more restrictive than recommended clinical guidelines.^{xxi} Many of the plans in the study analysis also participate in Medicare Advantage.

A recent study conducted by the Office of the Inspector General found that among the prior authorization

requests that MA plans denied, 13 percent met Medicare coverage rules, meaning that the services would have been approved if the patient had been covered by traditional Medicare.^{xxii} Another study on MA plans found that while prior authorization, step therapy, and Part D formulary design can help reduce unnecessary spending, in instances where a similar low-cost treatment option does not exist, coverage restrictions burden clinicians and limit access to critical medications without the potential benefit of reduced spending.^{xxiii} **While utilization management practices are intended to help reduce unnecessary health care costs and increase the affordability of health care, we are concerned by difficulties these practices can create for patients in accessing the latest treatments, services, and standards of care informed by personalized medicine.**

With personalized medicines accounting for more than a quarter of all new drugs approved by the FDA over the past seven years,^{xxiv} the pipeline for significant personalized therapies becoming available to patients is robust. Many of the personalized medicines approved by the FDA and in the pipeline are drugs targeted for patients with diseases and conditions that have very poor prognoses, such as advanced breast cancer, non-small cell lung cancer, leukemia, lymphoma, cystic fibrosis, and other rare diseases, among others. Medical product development is focusing more on therapeutics that define patient populations based on biological signatures and other factors that may influence an individual patient's response, transforming once-deadly diseases into manageable chronic conditions for some patients.

In contrast, utilization management practices like step therapy require a patient to try a lower-cost treatment before working up to a more expensive product if the initial treatment is ineffective. This perpetuates a one-size-fits-all treatment paradigm that facilitates the same treatment protocol for every patient, regardless of their biological differences. Step therapy can rob patients of time and reduce the quality of their lives by pre-empting the use of personalized treatments that have a high likelihood of working for them.^{xxv}

Similar to step therapy protocols, we are concerned with how prior authorization requirements can delay or inhibit patient access to personalized medicine, leading to poorer outcomes. Prior authorization gives health insurers a chance to review the medical necessity of an item or service for a patient before granting coverage. A PMC study on *Understanding Genomic Testing and Utilization in the US* identified complex administrative policies and prior authorization requirements as an obstacle to the consistent utilization of noninvasive prenatal testing (NIPT) in prenatal screening, whole exome sequencing (WES) in patients with rare and undiagnosed genetic diseases, and comprehensive genomic profiling (CGP) of tumors in patients with advanced cancer.^{xxvi} These tests underpin personalized medicine approaches and provide key information that helps patients understand their diseases and available care options.

In fact, we have heard that some MA plans have used prior authorization to delay or decline coverage for testing already covered under a National Coverage Determination (NCD) by requiring documentation in excess of what CMS requires to determine medical necessity, such as under NCD 90.2 regarding NGS-based testing for patients with advanced cancer. NGS technologies have played an essential role in advancing our understanding of the altered genetic pathways involved in human cancer.^{xxvii} Patients enrolled in traditional Medicare would not face these same coverage challenges. **Therefore, we believe that in instances where an item or service is already covered by an NCD, prior authorizations should not contain additional criteria beyond what is already included in the NCD.** In addition, MA

plans typically do not allow the laboratory servicing provider to participate in the prior authorization process, instead requiring the ordering physician to do so, which creates a natural roadblock in MA beneficiaries' access to medically necessary care. **PMC also believes that laboratory service providers should be able to participate in MA plans' prior authorization process to help streamline patients' access to necessary testing services.**

As shared in previous comments to CMS,^{xxviii} PMC recognizes the important role that utilization management tools play in helping health insurance companies manage health care costs. It is vital, however, that these tools support clinically appropriate care and align with the rapidly emerging science and practice of personalized medicine. As MA enrollment is expected to outpace traditional Medicare, this heightens our concerns that more patients could face additional barriers in accessing, or be denied, personalized medicine unless alternatives to step therapy and prior authorization are considered. Recent research points to the significant promise of innovative decision-support platforms to improve patient care and reduce total treatment costs. **We urge CMS to advance policy that harnesses next-generation decision-support and avoids reinforcing conventional policies that would blunt the adoption of personalized medicine.**

Part C: Driving Innovation to Promote Person-Centered Care

To reap the clinical and economic benefits of new interventions, PMC believes the United States must establish value-based reimbursement models that encourage investments in personalized medicine. Especially in the case of chronic and complex diseases, personalized medicine can offer significant short- and long-term benefits for preventing and curing diseases. For example, gene therapies can reverse the root causes of certain cancers and rare diseases with just one or a few treatments that make long-lasting changes to the genetic make-up of patients' cells. It is important that traditional reimbursement structures in the United States, designed around fee-for-service and one-size-fits-all care, do not disincentivize interventions that may raise short-term costs but yield greater clinical and/or cost value to patients over time. We recognize that health insurers have concerns about the financial risks and effects of high-investment medications,^{xxix} and appreciate CMS' request for information on how to promote value-based arrangements in MA plans.

Patients agree that value-based agreements can play a key role in advancing their access to personalized medicine. After listening to priorities from the patient community for advancing personalized medicine over two years, PMC published a patient-centered agenda with 45 research questions^{xxx} including:

- What evidence is needed, and where is there already adequate evidence, to support payers and other members of the health care community in collaborating to develop value-based contracts for personalized treatments that may have higher up-front costs?
- How can patient/caregiver perspectives, including their preferences regarding personalized medicine treatment options, their decision-making criteria, and their successful adherence to treatment, factor into the "value" defined in value-based contracts?

Based on this feedback, **we encourage CMS to prioritize opportunities to align MA plans on their evidence needs for value-based agreements and opportunities to incorporate patient-centered perspectives of value.** Value-based agreements could allow payers and drugmakers to collaborate in

unprecedented ways to ensure that patients have access to a new generation of potentially curative personalized treatments.

Part D: Supporting Affordability and Sustainability

- *Question 1: What policies could CMS explore to ensure MA payment optimally promotes high quality care for enrollees?*

Broad adoption of personalized medicine promises to help patients with cancer, rare diseases, or common chronic conditions achieve better outcomes and reduce avoidable health care costs. **In addition to supporting applications of personalized medicine discussed in previous sections of our comments, PMC encourages CMS to consider opportunities to promote more comprehensive medication management, such as through the use of pharmacogenomic (PGx) testing based on a drug’s FDA-approved label or clinical guidelines, in both MA plans and traditional Medicare.**

As one type of personalized medicine tests, PGx tests may be able to predict which medications at which doses will be most effective and less likely to lead to adverse events for individuals, based on their genetic makeup and known drug-gene interactions.^{xxxii} This information can help guide the application of medicines for many health conditions. For example, one case study in retirees over age 65 found that leveraging pharmacists’ expertise to recommend medication changes based on patients’ genetic information and known PGx implications resulted in a 7 percent decrease in emergency department visits and a 15 percent decrease in inpatient hospitalizations. This shift in health care resource utilization away from acute care services and toward more cost-effective primary care options led to a reduction of about \$7,000 per patient in direct medical charges. For 5,288 patients over 32 months, this yielded an economic savings of \$37 million.^{xxxiii} Looking at the impact of PGx testing on treatment for major depressive disorder, another study found that after providing PGx testing results to health care providers, patients showed a meaningful decrease in symptoms.^{xxxiii} By saving costs attributed to poor disease management, PGx testing could provide one alternative to utilization management tools in MA plans that directs patients to affordable, sustainable, high-quality care.

Part E: Engaging Partners

- *Question 3: What steps could CMS take to enhance the voice of MA enrollees to inform policy development?*

PMC thanks the agency for recognizing that the goals of Medicare can only be achieved through partnerships and an ongoing dialogue between the program, MA enrollees and other key stakeholders. Currently, designated patient representatives on advisory committees play a key, but limited role in informing CMS policy. Personalized medicine is a rapidly evolving field that consistently presents new opportunities to improve the quality of patient care in many diseases. **To deliver personalized medicine that accounts for a patient’s unique biology, medical history, circumstances and values, CMS must adopt a process for feedback that invites a multitude of patient voices, both in MA plans’ decision-making and in how CMS oversees MA plans. In reviewing feedback on this request for**

information, we encourage the agency to prioritize suggestions that would create a more dynamic and representative process for patient feedback.

Conclusion

PMC appreciates CMS' commitment to improving health care for beneficiaries enrolled in the MA program. We look forward to reviewing future proposals in response to this request for information and to working with you through future policy making opportunities to improve patient access to personalized medicine. If you have any questions about the content of this letter, please contact me at 202-499-0986 or cbens@personalizedmedicinecoalition.org, or David Davenport, PMC's Manager of Public Policy, at ddavenport@personalizedmedicinecoalition.org or 804-291-8572.

Sincerely yours,



Cynthia A. Bens
Senior Vice President, Public Policy

ⁱ Centers for Medicare & Medicaid Services. *Medicare Program; Request for Information on Medicare (CMS-4203-NC)*. <https://www.federalregister.gov/d/2022-16463>.

ⁱⁱ Centers for Medicare & Medicaid Services. *CMS Strategic Plan*. Modified August 18, 2022. <https://www.cms.gov/cms-strategic-plan> (accessed August 29, 2022).

ⁱⁱⁱ The Medicare Payment Advisory Commission (MedPAC). "Chapter 12: The Medicare Advantage Program: Status Report and Mandated Report on Dual-Eligible Special Needs Plans." *Report to Congress: Medicare Payment Policy*. March 2022. https://www.medpac.gov/wp-content/uploads/2022/03/Mar22_MedPAC_ReportToCongress_Ch12_SEC.pdf (accessed August 29, 2022).

^{iv} J. Michael McWilliams. "Don't Look Up? Medicare Advantage's Trajectory and the Future Of Medicare." *Health Affairs Forefront*. March 24, 2022. <https://www.healthaffairs.org/doi/10.1377/forefront.20220323.773602> (accessed August 29, 2022).

^v Centers for Medicare & Medicaid Services. *CMS Framework for Health Equity*. Last modified April 22, 2022. <https://www.cms.gov/About-CMS/Agency-Information/OMH/equity-initiatives/framework-for-health-equity> (accessed August 29, 2022).

^{vi} Personalized Medicine Coalition. *Using Health Data to Advance Personalized Medicine: Challenges and a Path Forward*. February 17, 2022. <https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/Using Health Data to Advance Personalized Medicine Challenges and a Path Forward.pdf> (accessed August 29, 2022).

^{vii} Personalized Medicine Coalition. *Using Health Data to Advance Personalized Medicine: Challenges and a Path Forward*. February 17, 2022. <https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/Using Health Data to Advance Personalized Medicine Challenges and a Path Forward.pdf> (accessed August 29, 2022).

^{viii} Apostolia M. Tsimberidou et al. "Clinical and Economic Value of Genetic Sequencing for Personalized Therapy in Non-small-cell Lung Cancer." *Clinical Lung Cancer*. November 1, 2020. Vol. 1(6):477-481. <https://doi.org/10.1016/j.clc.2020.05.029> (accessed August 29, 2022).

- ^{ix} Personalized Medicine Coalition. *Using Health Data to Advance Personalized Medicine: Challenges and a Path Forward*. February 17, 2022. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/Using_Health_Data_to_Advance_Personalized_Medicine_Challenges_and_a_Path_Forward.pdf (accessed August 29, 2022).
- ^x Arushi Agarwal et al. “A Quantitative Framework for Measuring Personalized Medicine Integration into US Healthcare Delivery Organizations.” *Journal of Personalized Medicine*. Vol. 11(3):196. March 12, 2021. <https://doi.org/10.3390/jpm11030196>.
- ^{xi} Personalized Medicine Coalition. *Understanding Genomic Testing Utilization and Coverage in the US*. June 2020. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_Understanding_Genomic_Testing_Utilization_and_Coverage_in_the_US2.pdf (accessed August 29, 2022).
- ^{xii} David W. Oslin et al. “Effect of Pharmacogenomic Testing for Drug-Gene Interactions on Medication Selection and Remission of Symptoms in Major Depressive Disorder: The PRIME Care Randomized Clinical Trial.” *JAMA*. July 12, 2022. Vol. 328(2):151-161. <https://doi.org/10.1001/jama.2022.9805>.
- ^{xiii} John F. Greden et al. “Impact of Pharmacogenomics on Clinical Outcomes in Major Depressive Disorder in the GUIDED Trial: A Large, Patient- and Rater-Blinded, Randomized, Controlled Study.” *Journal of Psychiatric Research*. Vol.111:59-67. April 2019. <https://doi.org/10.1016/j.jpsychires.2019.01.003>.
- ^{xiv} Joachim Benitez, Christina L. Cool and Dennis J. Scotti. “Use of Combinatorial Pharmacogenomic Guidance in Treating Psychiatric Disorders.” *Personalized Medicine*. Vol. 15(6). November 2018. <https://doi.org/10.2217/pme-2018-0074>.
- ^{xv} EveryLife Foundation for Rare Diseases. *The National Economic Burden of Rare Disease Study*. February 25, 2021. <https://everylifefoundation.org/burden-study> (accessed August 29, 2022).
- ^{xvi} U.S. Department of Health and Human Services. “New HHS Study Shows 63-Fold Increase in Medicare Telehealth Utilization During the Pandemic.” December 3, 2021. <https://www.hhs.gov/about/news/2021/12/03/new-hhs-study-shows-63-fold-increase-in-medicare-telehealth-utilization-during-pandemic.html> (accessed August 29, 2022).
- ^{xvii} J.S. Margarinos et al. “Implementation of a Novel, Single-Encounter Telemedicine Lung Cancer Screening (SET-LCS) During Covid-19 Preserves Access Among African Americans.” *Scientific Forum Presentation*. October 23, 2021. American College of Surgeons Clinical Congress 2021. American College of Surgeons. <https://www.eurekalert.org/news-releases/932355> (accessed August 29, 2022).
- ^{xviii} Personalized Medicine Coalition. *Comment Letter on Medicare Payment Advisory Commission (MedPAC) ’s March 2021 Report to the Congress: Medicare Payment Policy; Chapter 14: Telehealth in Medicare After the Coronavirus Public Health Emergency*.” June 10, 2021. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC-Comments_MedPAC_Report_Telehealth.pdf (accessed August 29, 2022).
- ^{xix} Avalere. “Utilization Management Trends in the Commercial Market, 2014–2020.” November 24, 2021. <https://avalere.com/insights/utilization-management-trends-in-the-commercial-market-2014-2020> (accessed August 30, 2022).
- ^{xx} Tori Marsh. “The Big Pinch: New Findings on Changing Insurance Coverage of Prescription Drugs.” *GoodRx Health*. October 26, 2021. <https://www.goodrx.com/insurance/health-insurance/the-big-pinch-fewer-prescription-drugs-covered-more-insurance-restrictions> (accessed August 30, 2022).
- ^{xxi} Kelly L. Lenahan et al. “Variation In Use And Content Of Prescription Drug Step Therapy Protocols, Within And Across Health Plans.” *Health Affairs*. November 2021. Vol. 40(11). <https://www.healthaffairs.org/doi/10.1377/hlthaff.2021.00822> (accessed August 30, 2022).
- ^{xxii} U.S. Department of Health and Human Services Office of Inspector General. *Some Medicare Advantage Organization Denials of Prior Authorization Requests Raise Concerns About Beneficiary Access to Medically Necessary Care (OEI-09-18-00260)*. April 27, 2022. <https://oig.hhs.gov/oei/reports/OEI-09-18-00260.asp> (access August 29, 2022).
- ^{xxiii} Kelly E. Anderson et al. “Medicare Advantage Coverage Restrictions for the Costliest Physician-Administered Drugs.” *The American Journal of Managed Care*. July 12, 2022. Vol. 28(7):e255-e262. <https://doi.org/10.37765/ajmc.2022.89184>
- ^{xxiv} Personalized Medicine Coalition. *Personalized Medicine at FDA: The Scope and Significance of Progress in 2021*. February 22, 2022. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/Personalized_Medicine_at_FDA_The_Scope_Significance_of_Progress_in_2021.pdf (accessed August 29, 2022).
- ^{xxv} Mara G. Aspinall and Richard G. Hamermesh. “Realizing the Promise of Personalized Medicine.” *Harvard Business Review*. October 2007. <https://hbr.org/2007/10/realizing-the-promise-of-personalized-medicine> (accessed August 29, 2022).

-
- ^{xxvi} Personalized Medicine Coalition. *Understanding Genomic Testing Utilization and Coverage in the US*. June 2020. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_Understanding_Genomic_Testing_Utilization_and_Coverage_in_the_US2.pdf (accessed August 29, 2022).
- ^{xxvii} Personalized Medicine Coalition. *Comment Letter on Proposed Decision Memo for Next Generation Sequencing (NGS) for Medicare Beneficiaries with Advanced Cancer (CAG-00450R)*. November 27, 2019. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_CMS_NGS_Coverage_Determination.pdf (accessed August 29, 2022).
- ^{xxviii} Personalized Medicine Coalition. *Comment Letter on Step Therapy for Part B Drugs in Medicare Advantage (MA)*. October 15, 2018. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_Comment_Letter_Step_Therapy.pdf (accessed August 29, 2022).
- ^{xxix} “AMCP Partnership Forum: Designing Benefits and Payment Models for Innovative High-Investment Medications.” *Journal of Managed Care & Specialty Pharmacy*. February 2019. Vol. 25(2):156-62. <https://www.jmcp.org/doi/pdf/10.18553/jmcp.2019.25.2.156> (accessed August 29, 2022).
- ^{xxx} Personalized Medicine Coalition. *Moving Beyond Population Averages: A Patient-Centered Research Agenda Advancing Personalized Medicine*. August 2020. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_Moving_Beyond_Population_Averages_A_Patient-Centered_Research_Agenda_Advancing_Personalized_Medicine1.pdf (accessed August 29, 2022).
- ^{xxxii} Personalized Medicine Coalition. *The Personalized Medicine Report: Opportunity, Challenges, and the Future*. 6th edition. November 17, 2020. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_The_Personalized_Medicine_Report_Opportunity_Challenges_and_the_Future.pdf (accessed August 29, 2022).
- ^{xxxiii} Joseph P. Jarvis et al. “Real-World Impact of a Pharmacogenomics-Enriched Comprehensive Medication Management Program.” *Journal of Personalized Medicine*. March 18, 2022. Vol. 12(3):421. <https://doi.org/10.3390/jpm12030421>.
- ^{xxxiii} David W. Oslin et al. “Effect of Pharmacogenomic Testing for Drug-Gene Interactions on Medication Selection and Remission of Symptoms in Major Depressive Disorder: The PRIME Care Randomized Clinical Trial.” *JAMA*. July 12, 2022. Vol. 328(2):151-161. <https://doi.org/10.1001/jama.2022.9805>.