MICROBIOME’S OMNIPRESENT UNSEEN GUESTS

Much of health care is delivered at the level of treating acknowledged symptoms, but it is what exists at less visible layers, such as the human microbiome housing several trillion microbial cells, that can be of critical importance. Patients and their caregivers in the clinical setting engage in transactions in which one group arrives with a concatenation of symptoms while the other group is confronted with the task of interpreting these signs correctly in order to develop an effective treatment plan.

An example of the value of comprehending and appreciating layers of increasing complexity is afforded by a painting completed by Salvador Dali in 1956 called *Nature Morte Vivante*, which in English translates into “Living Still Life.” Influenced by Nobel Laureate physicist Werner Heisenberg’s work in quantum mechanics, the title is a play on words characterized by the basic notion of something being perfectly still, yet continuing to be in motion simultaneously. The seeming paradox is explained by the fact that although an object may not appear to be moving, it is composed of millions of atoms that are in rapid motion.

A closer look at the canvas reveals other features that may not appear to be obvious upon cursory examination. Mathematics did not escape Dali’s attention as evidenced by his employment of the Fibonacci sequence, a generator of spiral images that appear throughout the painting. He associated the spiral with a key element of nature and became even more intrigued by it when he learned of the masterpiece 852-word article, highly unusual for its brevity, by James Watson and Francis Crick that was published in the April 25, 1953 issue of the journal *Nature*. These researchers suggested a spiral structure (a helix) for the salt of deoxyribose nucleic acid (DNA), one “with novel features of considerable biological interest.”

This helix would revolutionize genetics. Essentially no recognition was given, however, of the work of chemist Rosalind Franklin, whose x-ray diffraction studies in crystallography provided the imagery that inspired Watson and Crick. Assuming that Dali was unaware of her contribution, it is likely that he would have been fascinated to learn about this hidden layer of meaning that subsequently accrued to the enormous advantage of her newly more world famous colleagues.

Allied health clinicians and their patients often interact on the basis of seeking and providing relief from symptoms involving aches, pain, discomfort, and physical immobility. Additional layers that lack such clarity are semiotics (non-language features reflecting patient and caregiver differences based on age, sex, gender, race/ethnicity, and health literacy), genomics, proteomics, metabolomics, and the microbiome. The latter unseen guests continue to attract a significant amount of attention as demonstrated by the following examples of papers in the professional literature: Disruption of maternal gut microbiota during gestation alters offspring microbiota and immunity (*Microbiome*, July 2018), The gut microbiota and dysbiosis in autism spectrum disorders (*Current Neurology and Neuroscience Reports*, November 2018), and Researchers link gut bacteria to heart transplant success or failure (*Journal of Clinical Investigation Insight*, October 4, 2018).
In my message in the November 2017 issue, I indicated that I will be asking some of you to send a photo and answer a series of "fun" questions to be shared with our membership so that we can continue our collegiality through our newsletter. The 8th of many profiles this year is presented as follows:

Name and Title: Patricia A. Prelock, Ph.D., CCC-SLP, BCS-CL, Professor & Dean, College of Nursing and Health Sciences

Place of birth: Youngstown, OH

University: University of Vermont, Burlington, VT

How long have you been in your position? I am in my 10th year as Dean for the College of Nursing and Health Sciences and I have been a Professor in Communication Sciences and Disorders and in Pediatrics in the Larner College of Medicine for 18 years.

What’s the value of a university education? A university education creates opportunities for our next generation of scholars, leaders and health care professionals to create new knowledge, challenge perspectives, think critically, problem solve, and facilitate innovations in teaching, learning and practice.

What is the value of ASAHP? As a very new member of the organization, our college is experiencing the value of the communications (journal and updates), the opportunities for leadership training, and the potential for networking. We are just getting our feet wet in this new circle of connection with shared values and goals.

If I could teach in another field, which one and why? As a true interdisciplinary professional, I love teaching across the disciplines of medicine, social work, PT, nutrition, nursing, OT, education, psychology, integrative health, early childhood and special education. If I had to select one, it would probably be medicine (e.g., pediatrics, psychiatry, neurology) as I think they would gain significant value in understanding the roles and responsibilities of other health related disciplines.

Before I retire I want to: I don’t have any plans to retire as I love what I do, although I may slow down a bit in the next 10 years.

In college, I was known for: My energy and passion for serving with meaning.

What music is playing in my car/office? Typically, you would hear classical or country-western music.

The last book I read for fun was: Throwaway Children by Diney Costeloe

My favorite trip was: A Mediterranean cruise with my husband Billy during which we visited London, Italy, Spain, France, and the Rock of Gibraltar. I have enjoyed, however, several recent professional trips to Hong Kong, Japan, and China.

My hobby is: Walking, boating, snowshoeing, magic, traveling.

My passion is: My grandchildren and serving the needs of children with autism spectrum disorders.

Cats or dogs? We have 2 dogs, Riley (1 year old German Shepherd) and Cocoa (9 year old chocolate lab & a therapy dog).

E-book or hardback? I love the feel and ability to leaf through the pages of a hardback book.

Beach or mountains? We live on a sandy beach on Lake Champlain and can see both the Green Mountains of Vermont and the Adirondacks of NY, so I love the beach, the mountains and the trees of Vermont.
REFLECTIONS ON AN EXPERIMENT IN DEMOCRACY

The founders of this nation envisioned an arrangement in which the executive, legislative, and judicial branches of government would function effectively to meet the needs of the populace in both domestic and foreign matters. That experiment has endured for some 240 years in times both good and bad. Leaders in all three branches either are elected or appointed while the month of October in each even-numbered year results in a federal election that involves one-third of the Senate and all members of the House of Representatives who aspire to remain in office. These officials return home that month to make their individual appeals to the electorate.

Much of what transpires in government that works beneficially tends to occur without attracting much notice. Social Security checks are mailed or deposited into private accounts every month, payments are made to providers by the Centers for Medicare & Medicaid Services, and members of the military serve in posts throughout the world to safeguard the nation’s interests. As of the end of October 2018, the U.S. Census Bureau estimates that the population is nearly 329 million inhabitants. Given that a typical family consisting of only five individuals can engage in heated disputes regarding, what time to have dinner, what to eat, and whether the meal should consist of home-cooked or carry-out comestibles, it comes as no surprise that a national agglomeration in the hundreds of millions will generate vastly different and especially noisy opinions on the essential roles that government should play in their lives.

Key political factions often are described in binary terms, such as Democrat and Republican or liberal and conservative. Stuck in heavy traffic with no idea of what is happening further up the road and well beyond view, a liberal might conclude that if a police officer was at the main intersection that lies in the distance, traffic would be able to flow more smoothly. A conservative sitting in the next vehicle might just as easily believe that there must be a uniformed official at that same intersection. Otherwise, the situation would not be as messed up as it appears to be. The basic difference between these opposing points of view is that one group believes that government must be more involved as a desirable mechanism to solve various problems while the other group sees that same entity as the cause of a great many difficulties.

Yet, although progress may appear to be too slow at times, constructive action does occur. Presidents propose budgets and Congress acts on them in ways that its members see fit. Ultimately, agreements are reached on spending priorities and the chief executive signs appropriation bills into law. Medicare data show that spending for this program was 15 percent of total federal spending in 2016 and is projected to rise to 17.5 percent by 2027 while the Medicaid program helped provide health care to an estimated 73 million individuals in fiscal 2017 at a cost of about $596 billion. Several congressional committees and sub-committees in both chambers provide valuable oversight of executive branch activities pertaining to these two programs. Moreover, public hearings furnish an opportunity for representatives of a wide range of organizations in the private sector to weigh in with their opinions in ways that accrue to the advantage of program beneficiaries.

As was the case with deciding on the legality of the individual mandate created by the Affordable Care Act, the Supreme Court also sometimes will join a fray to arbitrate jurisdictional controversies. Thus, while it is somewhat less than perfect, the nation’s experiment in democracy endures in meaningful ways.

2018-2019 ASSOCIATION CALENDAR OF EVENTS

Fall 2018—Institutional Profile Survey To Be Conducted

October 16-18, 2019 —ASAHP Annual Conference in Charleston, SC

October 26-30, 2020—ASAHP Annual Conference in Long Beach, CA
HEALTH REFORM DEVELOPMENTS

Page three of this issue of the newsletter refers to the federal election in November 2018 that will determine the composition of both the House and the Senate, beginning in 2019. As in previous contests that have been conducted since 2010, the Patient Protection and Affordable Care Act (ACA) of 2010 has the potential to influence the outcome. Not a single Republican in either chamber voted in favor of the ACA when it became law. Many candidates of that political party also chose to focus on its negative aspects when vying for office in the elections of 2012, 2014, and 2016. From the time of its inception, multiple attempts also have been made in Congress to repeal and replace this legislation.

Upon assuming the majority in both chambers and taking control of the White House after the 2016 election, Republicans appeared to be in a strong position to achieve their objective of eliminating this law. They came close to doing so in 2017, but the ACA remains in effect and many Democrats are using that fact as a basis for attacking Republicans in the upcoming November 2018 election. A key feature of the ACA is that it eliminated the ability of insurance companies to prohibit patients with preexisting conditions either from obtaining coverage or by requiring them to pay exorbitantly priced premiums for such protection. The Democrat’s message in the present election cycle is: Republicans intend to return to the days when insurers possessed such power and Democrats pledge to prevent them from doing so.

Employers’ Reimbursement Arrangements To Provide Health Coverage For Employees

Meanwhile, the Departments of Labor, Health and Human Services, and the Treasury proposed new rules in the October 29, 2018 issue of the Federal Register pertaining to how employers may use health reimbursement arrangements (HRAs) to provide health coverage to employees. The rule would expand the uses of HRAs to include payment of premiums for individual market coverage in some instances. The Departments estimate that the proposed changes would have an impact on coverage for approximately 10.7 million individuals, decrease the number of uninsured by 800,000, and cost the federal government approximately $30 billion in lost tax revenue from 2020-2028. The proposed rule was issued in compliance with an October 2017 Executive Order on “Promoting Healthcare Choice and Competition Across the United States,” suggesting that these changes would help make coverage more affordable for small to mid-sized employers and provide employees with more coverage options. Public Comments can be submitted for 60 days after publication of the rule.

Access To Health Care For Low-Income Adults With & Without Medicaid Expanded Eligibility

Low-income adults in states that expanded Medicaid under the Affordable Care Act were less likely to report having any unmet medical needs compared with those in non-Medicaid expansion states, according to a Government Accountability Office (GAO) report released on October 15, 2018. Among other findings:

- About 26 percent of low-income adults in Medicaid expansion states reported having unmet medical needs compared to 40 percent in non-expansion states.
- About 9.4 percent of low-income individuals in Medicaid expansion states said that they passed up needed medical care in the past 12 months because they couldn't afford it, compared to 20 percent in non-expansion states.
- About 82 percent of low-income adults had a usual place of care in Medicaid expansion states compared to 68 percent in non-expansion states.

Health and Workplace Benefits Survey (WBS) Results

The EBRI/Greenwald & Associates Health and Workplace Benefits Survey (WBS) of 1,025 workers in the United States ages 21–64 was conducted in June 2018. Among its main findings: (1) Workers rank health care as the most critical issue in the nation, (2) One-half of workers describe the health care system as poor (22 percent) or fair (28 percent), (3) Confidence about the health care system is mixed and declines looking into the future, and (4) Thirty-four percent of workers say they are confident that they are able to afford health care without financial hardship today, but this percentage decreases to just 30 percent when they consider the next 10 years.
Students and their families view attainment of a baccalaureate degree as an important first step in obtaining a decent paying job upon graduation. Given the fact that the costs of pursuing a college education are beyond the financial reach of many families in the United States today, they especially want their investment to produce favorable outcomes for their offspring in the job market.

Unfortunately, not all academic majors are geared toward producing graduates who will be in high demand by employers seeking workers with that level of formal education. According to a new report from the data analytics firm Burning Glass Technology, some vocationally geared majors, such as fitness studies and criminal justice do not fare as well compared to majors in other areas, such as English and gender studies. All too many students may find jobs after graduation, but in the context of their educational background, they are underemployed.

Health care education programs continue to be an exception. A rapidly growing proportion of the population that is age 65 and older, a group characterized by highly significant numbers of individuals who have one or more chronic conditions, means that the demand for health care services will grow. Shortages of physicians and dentists suggest that there will be increased opportunities for graduates of physician assistant and dental hygiene programs, to cite just two examples, to obtain gainful employment in the health sector following graduation. A challenge will be to ensure that high school graduates are prepared adequately in science and mathematics to thrive academically in health science higher education programs. Just as importantly, it will be essential to attract more students from underrepresented racial and ethnic groups in order to achieve a greater alignment with major demographic changes that the U.S. population is undergoing.

Negotiated Rulemaking For Accreditation And Innovation
The U.S. Department of Education (USDE) announced a negotiated rulemaking on higher education accreditation and innovation, along with three subcommittees to address distance learning and educational innovation, faith-based entities’ participation in Title IV programs and TEACH Grants. A main committee will focus on accreditation while three subcommittees will address these additional issues. The negotiated rulemaking committee will meet three times in 2019: on January 14-16, on February 19-22 and on March 25-28. Each of the three subcommittees also will meet three times, on January 17-18, February 12-13 and March 11-12. The meetings will be held in Washington, DC. Topics to be addressed by the main committee will include:

- Requirements for accreditors in their oversight of institutions
- Criteria used by the Secretary to recognize accrediting organizations
- Simplification of USDE’s recognition of accrediting organizations
- Clarification of the responsibilities for each member of the “triad” (accreditors, states and USDE)
- Clarification of permissible arrangements between institutions and others providing an education program

Delayed Publication Of New Regulations For Borrower Defense And Gainful Employment
The USDE also announced that final regulations for borrower defense to repayment will not be published by November 1, 2018. The agency received more than 38,000 comments on its proposed borrower defense rules, indicating that additional time is needed to review the comments. Borrower defense regulations focus on the conditions under which students may obtain relief from federal loans. Additionally, final gainful employment regulations also will not be published by November 1, which means that current gainful employment regulations will remain in effect. These regulations address whether or not students who have borrowed federal money complete programs leading to earnings that enable the students to repay the loans. The missed deadlines for publishing new borrower defense and gainful employment regulations mean that the earliest date either could be implemented will be July 2020.
QUICK STAT (SHORT, TIMELY, AND TOPICAL)

U.S. Adults Who Should Take Statins For Heart Disease Prevention Fail To Do So
Only 42% of the 26.8 million adults for whom statins are recommended to prevent heart disease actually take the medications, according to an Agency for Healthcare Research and Quality (AHRQ) study. Statin use rates have remained flat in the last decade, despite evidence that they reduce death from heart disease. In 2016, the U.S. Preventive Services Task Force (USPSTF) released new recommendations on statin use to prevent heart disease, the leading cause of death among adults age 40 and older. Using data from AHRQ’s Medical Expenditure Panel Survey to assess the size and characteristics of the population that meets the USPSTF criteria for statin use, researchers found that among adults recommended for statin use, women, Hispanics and individuals living in the South or without health insurance were less likely to receive them. A conclusion reached is that new USPSTF recommendations may result in decreased personal costs and expanded access to statins.

Fast Food Consumption By U.S. Adults
Data from the National Health and Nutrition Examination Survey reveal that during 2013–2016, 36.6% of adults consumed fast food on a given day. The percentage decreased with age: 44.9% aged 20–39, 37.7% aged 40–59, and 24.1% aged 60 and over. A higher percentage of non-Hispanic black adults consumed fast food than non-Hispanic white, non-Hispanic Asian, and Hispanic adults. The percentage of adults who consumed fast food increased with more family income. Among those who consumed fast food, men were more likely than women to eat fast food at lunch, but women were more likely to report eating fast food as a snack. Fast food is a part of the American diet and has been associated with high caloric intake, and poor diet quality. Time, financial resources, price, and availability influence fast food consumption, which was based on 24-hour recall.

HEALTH TECHNOLOGY CORNER

Use Of Biological Swimmers As Cargo Delivery Agents In Blood
Nature presents intriguing biological swimmers with innate energy harvesting abilities from their local environments. Use of natural swimmers as cargo delivery agents presents an alternative strategy to transport therapeutics inside the body to locations otherwise difficult to access by traditional delivery strategies. A manuscript published on September 25, 2018 in the journal Advance Materials describes a biocompatible biohybrid microswimmer powered by a unicellular freshwater green microalga, Chlamydomonas reinhardtii. Nontoxic and biodegradable, it moves by lashing a propeller-like tail. The researchers outfitted individual algal cells with magnetic polymer beads that could hold drugs in small amounts and allowed the researchers to steer the algae by applying a magnetic field to them. In the laboratory, these microswimmers darted through bodily fluids such as blood at more than 100 micrometres per second and successfully deposited payloads onto mammalian cells.

Novel Devices For Studying Acute And Chronic Mechanical Stress In Retinal Pigment Epithelial Cells
Macular degeneration (AMD) is the leading cause of adult blindness in developed countries. Physical changes within the retina are an important factor in its development. As reported in a study published on October 8, 2018 in the journal Lab on a Chip, researchers at Utah State University aimed to mimic changes in cells and find the mechanisms for the initiation and progression of diseases. Their study examines the effects of mechanical stress on elevated protein levels and abnormal development of new blood vessels. They were able to develop new devices to stress human cells in the lab mechanically. One device is designed to mimic slow and continuous stress levels and a second one is used for mimicking high levels of stress. They discovered that mechanical stress results in the expression of vascular endothelial growth factor, a protein that can cause disease initiation and progression. Besides AMD, mechanical stress can occur in other diseases including diabetic retinopathy and even cancer.
AVAILABLE RESOURCES ACCESSIBLE ELECTRONICALLY

2017 National Healthcare Quality And Disparities Report

For the 15th year in a row, the Agency for Healthcare Research and Quality (AHRQ) has reported on progress and opportunities for improving healthcare quality and reducing healthcare disparities. The 2017 National Healthcare Quality and Disparities Report recently was made available. It tracks more than 300 healthcare process, outcome, and access measures, covering a wide variety of conditions and settings. The report and chartbooks are organized around the concept of access to care, quality of care, disparities in care, and six priority areas, including patient safety, person-centered care, care coordination, effective treatment, healthy living, and care affordability. Trends show that about 55% percent of quality measures are improving overall for Blacks, however, most recent data in 2014-2015 show that about 40% of quality measures were worse for Blacks compared with Whites. Trends also show that about 60% of quality measures are improving overall for Hispanics, but in 2014-2015, nearly one-third of quality measures were worse for Hispanics compared with non-Hispanic Whites. The report can be obtained at https://www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/2017nhqdr.pdf.

Interoperability Among Health Care Technologies

While health care has made great strides in the proliferation of electronic health records, establishment of regional health information exchanges, and development of data exchange standards and interfaces, interoperability among health care technologies remains quite limited, according to a report from the National Academy of Medicine that recently was made available. Interoperability is the ability to deliver data seamlessly and automatically across time and space from and to multiple devices and organizations. A lack of interoperability results in waste, inefficiency, and clinician burnout, according to the report. The document outlines steps for health systems to establish comprehensive, ongoing procurement strategies with system-wide interoperability by moving away from serial purchases of individual software and hardware with proprietary interfaces toward those that will interoperate with others through a vendor-neutral open platform. The report also contains a technical supplement that details specific approaches. It can be obtained at https://nam.edu/procuring-interoperability-achieving-high-quality-connected-and-person-centered-care/.

Enhancing High Schools As A Driver Of Individual Mobility And Community Progress

For much of the last century, high schools served as a driver of individual mobility and community progress. Today, however, in too many school districts and communities, high schools are no longer fulfilling that promise. There remain about 1,300 traditional high schools in need of serious improvement and redesign. With an average graduation rate of 49%, these low-graduation-rate high schools are concentrated in 18 states from the inner city to the heartland and sit at the fault lines of race, class, and inequity in America. Yet, clear rays of hope exist. Over the last two decades, the number of low-performing high schools has been cut in half, as high school graduation rates have reached an all-time high. While graduation at the remaining low-performing high schools still is just a 50-50 proposition, these schools make up a small percentage of high schools throughout the country, totaling just 10% of all traditional high schools enrolling 300 or more students. Among its various topics, the Great American High School report includes coverage of progress made and remaining challenges in enabling all students to graduate from high school ready for college or career. The report can be obtained at http://www.americaspromise.org/sites/default/files/d8/GreatAmericanHighSchoolCampaignReport.pdf.
GENDER PEER EFFECTS IN DOCTORAL STEM PROGRAMS

The underrepresentation of women in science, technology, engineering, and mathematics (STEM) fields can begin as early as grade school and intensify at each successive career step so that men greatly outnumber women as scientists and engineers at senior levels. This underrepresentation of women in STEM is a topic of great interest in economics and public policy today. Yet, factors affecting persistence in these fields are not well understood and understanding the nature of the situation especially is limited at the graduate education level. A step in the direction of learning more is represented by a paper released by the National Bureau of Economic Research (NBER) last month. It describes an investigation of peer gender composition in the training process of STEM doctoral degrees.

Using year-to-year variation within doctoral programs in the fraction of each cohort that is female, researchers found that women in cohorts with no female peers are less likely to graduate within six years of initial enrollment than men, but an increase in the share of female peers in a cohort increases the probability of on-time graduation for women as compared to their male counterparts. This effect largely is driven by students in typically male programs (less than 38.5% female students in the average cohort) and by dropout behavior in the first year of enrollment. Peer gender composition has a small effect on first term GPA and no effect on the probability of obtaining research funding. The small/null findings for these two channels suggest that the results largely cannot be explained by women learning or competing more successfully in cohorts with more female peers. The findings are consistent, however, with a climate mechanism, through which more female peers create a female friendly environment that encourages women to persist in doctoral programs, despite having no significant effect on learning or financial support. Taken together, the findings indicate that peer gender composition can be a useful proxy for climate and that yearly variations in this measure can provide a useful identification strategy for investigating gender gaps in outcomes.

IDENTIFICATION OF FITNESS TRENDS FOR 2019

While much of the health care domain is characterized by efforts to treat disease, an important portion of it is oriented toward enhancing health promotion and disease prevention. The November 2019 issue of the American College of Sports Medicine’s (ACSM’s) Health & Fitness Journal features articles and columns dedicated to several top trends in the 2019 fitness survey, a study in its 13th consecutive year of being conducted. Responses came from more than 2,000 health fitness professionals from around the world and these respondents represented all sectors of the industry: commercial, clinical, community, and corporate. This annual survey is viewed as being useful because it emphasizes the value of appreciating the differences between trends and fads in the fitness industry, helping to make important investment decisions and programming decisions for future growth and development. Despite the inherent difficult of predicting the future of any industry, the survey helps to track trends that can assist owners, operators, program directors, and health fitness professionals with making important business decisions.

Wearable technology took over the #1 spot for 2019 after dropping to #3 in 2018, which may be the result of manufacturers correcting some monitoring inaccuracies of the past. High Intensity Interval Training (HIIT), the #1 trend in 2014 and 2018, fell to #3 for 2019. Group training made a significant return in 2017 as the #6 trend and has been the #2 trend for the past two years (2018 and 2019). Fitness programs aimed at older adults have regained some popularity after falling out of the top 10 trends in 2017, appearing at #9 in 2018 and becoming #4 for 2019. Bodyweight training first appeared as a fitness trend at #3 in 2013 and has been a top five fitness trend since that time, realizing a peak as the #1 fitness trend in 2015. In 2019, bodyweight training is the #5 fitness trend. A new trend to watch will be the employment of certified fitness professionals, a new potential trend for 2019 (#6) replacing educated, certified, and experienced fitness professionals, which was determined to be too broadly defined for this survey. Other trends to watch are mobile exercise apps, worksite health promotion and workplace wellbeing programs, outcome measurements, and postrehabilitation classes.