SPH2020

Wake-up: Today is September 20, 2020!

It's September 20, 2020. You start the day on an elliptical machine at the Wellness Center. Your workout is an individualized plan, based on your age, weight and various biologic parameters, like blood pressure and VO_2 max. A before-and-after breath analyzer integrates changes in key metabolites. At the end of the workout, a session summary goes to your exercise file wirelessly and adjusts tomorrow's exercise plan accordingly. You also get a calorie/food plan for the day from the health monitor that's a ubiquitous part of your day. You're always connected!

You drive your electric car to the School, where you will plug into the charging station, powered by a NanoSolar film that has been added to the skylights and painted on the roof near the smog chamber Dr. Harvey Jeffries and colleagues created so long ago. On the way, as you approach the dry cleaners, your location-aware communicator reminds you to drop off the cleaning. You tell it "Later" and it says "OK." A reminder is posted to your calendar.

You feel really good walking into the Michael Hooker Research Center (the building could use some refurbishing now that it's paid off) and bound into the Atrium Café, which has expanded since 2010. There, you pick up a specially prepared smoothie with micronutrients formulated for your body's needs, based on the plan generated at the Wellness Center. Dr. Steve Zeisel's team at the Nutrition Research Institute in Kannapolis has made it possible to tailor micronutrients to a specific individual. Alice Ammerman's community garden volunteers raise fruits, herbs and vegetables for the café in the Public Health Commons that surround the School.

The world of 2020 will be very different from our world today. And yet, it will not be unrecognizable. Or will it???

Crossing into the atrium, you smile at the public health gamers testing a new game they created. (They're paying for their education this way.)

Jeremiah Slaczka (co-founder and creative director, 5th Cell): Gaming will continue to become much more mainstream and accepted as kids grow up completely surrounded by games.

You look at the atrium, filled with students, staff and faculty, and think about the diverse mix of races, religions, political views, countries of origin and sexual orientations. It's great to work in an environment with

such richness of experience and perspective. You feel at home here.

As you walk down the hall, you see that water scientists are sending a new filter design to the 3-D printers in several SPH centers throughout the water-starved world, where they can begin full-scale production within hours in factories funded by micro-loans. It's so exciting that they're running a successful business.

You walk into your paperless office (which only became possible now that digital paper is less costly than the real thing) and do a quick scan of your LCD wallpaper for news from around the world that you and a group of editorial avatars created, based on your own interest profile. You pay special attention to the global interactive Dr. Peggy Bentley, Gretchen Van Vliet and colleagues created.

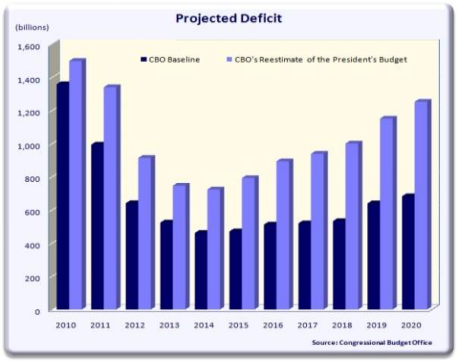
Experts say the use of virtual worlds like Second Life may be widespread by 2020.

You listen to next-generation TweetVox feeds from some of them and look at FaceBuzz (Google bought Facebook in 2017) postings from overnight.

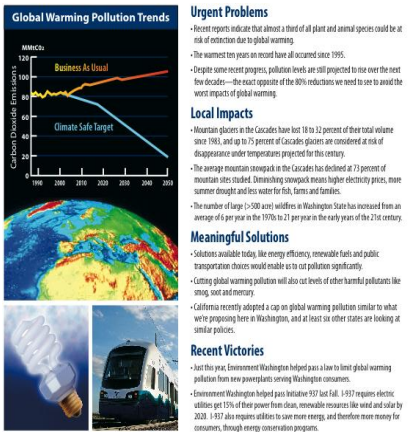
You check on a student Gillings Innovation Lab water project in Tanzania, using 24/7 augmented-reality enhanced webcams at the site (some mounted on unmanned aerial vehicles that you control from your office). They include image recognition layers developed by the first-year PHIT (Public Health information Technology) students who came here for the respected interdisciplinary program in public health informatics.

You check Dr. Barry Popkin's *World is Fat* map. Another country has become red, showing the increasing spread of global overweight and obesity.

The deficit is still climbing, however, according to the visualization in your office.



The global climate meter shows steady melting of glaciers in Antarctica. There have been more big storms in recent years. You're glad a team of people in the SPH is working on that problem under the leadership of Drs. Jason West and Jill Stewart.



Your personal health care advisor (PHA) has set up an automatic scan of your blood pressure via your body sensor, and it waits for you to remain quiet for a few minutes to get an at-rest reading before sending it through the secure biometrics network. You rarely see a physician since health care reform became real in 2014. New technologies are making health care more responsive. Smart Band-Aids developed in 2010 are even better now in 2020 at transmitting information, and that's just one example.

A lot of people predicted doom and gloom, but health care reform is working for most people, especially since investments in prevention have grown and paid off. Many of the School's faculty, staff and students have been part of the process. Dr. Jon Oberlander had it right early on.

Genetic medicine finally is achieving its original hype. You like the individualized advice your PHA gives you, using genetic analysis. Soon, to achieve optimal health, you'll receive nanobots that will release nutrients, medicine and/or hormones while trolling throughout your bloodstream.

If you could just lose a few more pounds, you might get rid of the old-fashioned hypertension medicine once and for all.

You turn to an exciting research project in which you and colleagues from 10 U.S. schools of public health and 10 other international schools have pooled large datasets using the iRODS platform (integrated Rule-Oriented Data System) to form a huge dataset comprised of linked data from surveys, biological samples, behavioral and environmental data, genomic analyses, GIS tracking and a lot of other sources. The research team includes epidemiologists, behavioral scientists, nutrition scientists, geneticists, biostatisticians, informaticians, global community advocates, students and others. You work cooperatively on papers using the latest collaboration and visualization tools.

Dr. Bill Kaufman interacts with 3D visualization of protein-protein interaction data.

It took a while for you to master these large datasets. You gained facility with new computational tools (with help from Drs. Fred Wright and Ivan Rusyn), particularly those that project data as three-dimensional, explorable clouds. It's really exciting. (*2020 students already have these skills.)*

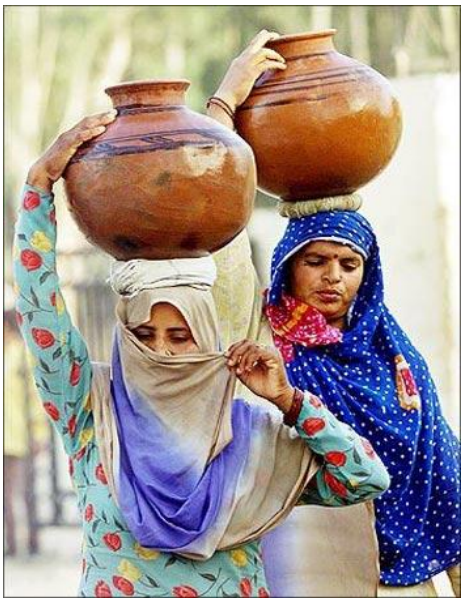
You meet with your project assistant, who mentions that work is a lot more satisfying in 2020 than it was in 2010. He's able to focus on higher-order functions since so many processes have been automated. And it's nice to be getting raises again.

A couple hours later, you're ready to lead your virtual, global seamless class on social determinants of health. Students are from the U.S. and 20 other countries, and they come together in a way that feels like they are in the same room. The autostereoscopic 3-D displays that require no special glasses make a huge difference. Many of the students are not physically in the room, but the display wallpaper is so good that you often forget that fact.

This is way beyond 2010 technology limits. The foundation laid by Drs. Brooks, Havala-Hobbs, Zelman and others has really paid off. Students are working across countries and disciplines on a variety of projects. You check in with each team, sometimes following them virtually into field settings. You never lecture anymore. Technology-enabled collaborative learning is now a way of life. You know the students always will be a step ahead on technology. That's OK, because it's a partnership.

Off to a department meeting. The Mayes videoconference center was replaced by a virtual conference room where your department's faculty members sit at the same table with faculty from South Africa, where our sister SPH is located. (They especially like the 24/7 cappuccino/espresso maker in the rooms!) Start times for meetings vary, so no one has to draw the midnight start time twice in a row! Everyone is energized by this new partnership.

The theme for today's meeting is a profile of the incoming classes of students, both undergraduate and graduates. The vast majority have never been without a 24/7mobile communicator of some kind. Many, if not most, have grown up in a world where location-awareness is part of everything they do. Cameras in their mobile devices not only can find and focus on familiar faces, but also can label those faces with identities — and more. These students have very different perceptions about the ownership of information from the oldest faculty members



Most students have never known a world without AIDS. The global and distance-learning technologies that make a more diverse student body possible also bring students from vastly different realities into the same virtual and actual space. Students who walk miles to fill a family water container will be online this semester for a seminar on health behavior, sitting, virtually, next to students who have never missed a meal or lacked water.

The meeting ends with as many questions as it began. After all, students of 2020 are preparing to work in the world of 2025, 2030 and beyond. Who are these students, really? What sorts of habits, learning skills, social patterns, technologies and life experiences do they bring that we who are older than they (but not technologically wiser) cannot even see? What sciences and technologies of prevention and intervention will they need in 2030? What new methods will be needed? Planning is as much a challenge in 2020 as it ever was.

You look at your bodycalc (fine-tuned by Dr. Deborah Tate and her students) and notice that you haven't yet burned all the calories your plan specified for today. You decide to hold your next meeting on the work-enabled treadmill that James Levine designed awhile ago. The treadmill has gotten a lot better since then, and many faculty members have them in their offices. A recent FMRi study showed that cognitive performance is enhanced by working out while brainstorming.

Steelcase treadmill workstation, 2010

Just another day in 2020…

For more information about 2020: http://tinyurl.com/worldin2020**; also see http://www.ifpri.org/.**
Images in this piece are from there and a few other sources.

- ***Barbara K. Rimer***
(with thanks to Bernard Glassman for technology contributions)