# The Use of Explicit Health Benefits Packages Increases Support for Universal Health Care for People with High Objective Numeracy

Healthcare in the United States is a significant burden on the average American. The financial strain of medical expenses affects over 71.5% of bankruptcies and is the number one contributor to bankruptcy in America (Himmelstein 2019). Insurance is likewise not affordable, as indicated by the fact that 11.1% of Americans are uninsured (“Trends in the U.S. Uninsured Population, 2010-2020”, 2021). Underinsurance, defined as unsustainable health spending, with 10% of household income going to health costs, has also surged to 21.3%, resulting in nearly a third of the US population lacking critical health services (Collins 2020). In the US, 54% of underinsured, and 59% of uninsured went without necessary medical services (Schoen 2005). The rising cost of insurance is especially concerning given the deadly consequences. Healthcare outcomes are also shockingly poor considering how much the US spends. In 2016, 17.8% of GDP was spent on healthcare, with other high-income countries spent between 9.6% to 12.4%. Yet the US has the lowest life expectancy of these countries, 78.8, compared to an average expectancy of 81.7 (Papanicolas 2018).

One plausible answer to skyrocketing health costs and ineffective outcomes is Universal Health Care (UHC). UHC directly addresses US concerns regarding cost of healthcare, lack of coverage, and poor health outcomes. Cost of implementation temporarily spikes total healthcare spending, but has historically resulted in reduced spending later. For example, health expenditures increased by 14% when Taiwan implemented UHC in 1995, however, annual spending increases were 4.1% afterwards, cutting by half the 8.3% increase pre-UHC (Hsiao 2016). UHC also allows for a single buyer market for purchase of healthcare goods and technologies (such as pharmaceuticals) leading to reduction of aggregate costs (Hussey 2003). UHC obviously improves coverage. Several countries with sub 60% coverage surged to 99% within a year of implementation of UHC (Hsiao 2016, Panpiemras et al. (2011). Increased coverage results in lower mortality and better overall health in the population (Galvani et al. 2017). While there are clear benefits to implementing UHC in the US, only 28.2% Americans support doing so (Holahan et al., 2019). Thus, increasing the likelihood of implementation by improving support for UHC is valuable. The goal of this project is to test if interventions designed to directly address common reasons for opposition to UHC can lead to improved support of UHC.

## Inadequacies with our current system

The purpose of health care is to improve the well-being of those treated. However, 61% of all debt in America originates from medical costs, with the average American owing $9,374 (Austin, 2014; Schoen 2005). Considering that medical debtors are 42% more likely to suffer from a lapse in medical coverage, the American health system often worsens the well-being of those treated instead (Himmelstein, 2005). This is particularly relevant in the US as some of our most disadvantaged minorities simultaneously suffer from low rates of insurance compared to Whites (11.7% for Whites, 20.8% for Blacks, 30.7% for Hispanics) (Shen et al., 2013). Medical debt is accrued partly due to extreme cost differences in medical care, with the US paying approximately twice the Organisation for Economic Co-operation and Development (OECD) median cost for medical procedures and pharmaceuticals (Anderson, 2003; Papanicolas, 2018; Tikkanen, 2020). This is compounded further by a general unwillingness to ration care and administrative complexity, pushing cost higher with low value outcomes (Reinhardt 2004). Additional structural obstacles exist due to the current competitive marketplace of multiple insurers. Preventative care and investment in medical infrastructure that generates long term value are under-invested in, as insurers share the benefits from the cost of implementation with their competitors (Anderson, 2003). Waste in the US health system is unnecessarily high due to the lack of centralized payment and distribution as well (Shrank 2019). Estimates of waste range from $760 billion to nearly $1 trillion, approximately 25% of total health spending. Over 40% of this waste is caused by a combination of administrative complexity and inflated pricing for healthcare. Medical care is plainly unaffordable in the United States for many.

In addition to the inflated cost of care, health outcomes in the US are also notoriously poor. Life expectancy in the US has not improved since 2014, even as the per capita cost of healthcare has risen from $9,466 to $11,582 (National Health Expenditure Accounts Tables, 2014-2019; Murphy, 2014; Kochanek 2019). This is distressing when we consider that up to 50% the care provided is not evidence based (Manchikanti et al., 2010). Issues with quality of care are further exacerbated by our current system of fee-for-service distribution. Low quality and ineffective pharmaceuticals are distributed more quickly through the US health system compared to peer countries with UHC due to demands for rapid adoption of new treatments, without necessarily proving their long-term efficacy (Kyle, 2017). US healthcare is ranked as low as 15th out of 25 major industrialized countries, partly due to inflated costs, waste, fraud, and the poorest aggregate utilization of physician visits and hospital days per capita (World Health Report, 2000; Anderson, 2003). The US also falls behind other high-income OECD peer countries on almost every health outcome metric (Tikkanen, 2020). Regarding mental health, the US has the highest suicide rate with 13.9 per 100,000 versus an average of 11.5. Examining recurrent health problems, the US also suffers from the highest chronic disease burden (28% of population versus an average of 17.5%) and rate of obesity (40% versus an average of 21%) by far. Lastly, people in the US have the highest rates of hospitalizations and deaths from preventable causes (approximately 50% greater hospitalizations, and 70% greater deaths, than the OECD average). While the US spends the most in both percentage of GDP as well as absolute amount on healthcare by a significant margin, our health outcomes are uniformly worse than peer nations.

## Benefits of Universal Health Care

Before delving into the benefits of UHC, it is important to define exactly what “Universal Health Care” means. A resolution adopted by the UN General Assembly states that UHC is “access to key promotive, preventive, curative, and rehabilitative health interventions for all at an affordable cost” (Assembly, 1991). The most obvious benefit of UHC is that it leads to improvement in coverage. In both Thailand and Taiwan, within one year of implementation of UHC insurance coverage surged from less than 57% to over 97% (Panpiemras et al., 2011;Hsiao, 2016). This improvement in coverage is vital. In the US, the uninsured and underinsured are between 25-40% more likely to die, with over 44,000 deaths per year, rivalling the impact (42,000 deaths) of kidney disease (Franks 1993, Wilper 2009). Neonates are especially at risk, with lack of insurance increasing the risk of death by 260%, more than being born with congenial malformation (Morriss 2013). In general, by improving coverage, population health improves.

Furthermore, having a UHC system can improve health outcomes through channels other than increased coverage. A UHC system allows for centralization of control and information for a country. During both the 2003 SARS epidemic and the 2009 H1N1 outbreak in Taiwan, automatic reporting and contact tracing integrating the travel and healthcare systems allowed for simple and effective contact tracing (Hsiao, 2016). Greater proportions of public health spending versus private health spending have also been shown to enhance overall health in 17 Organisation for Economic Co-operation and Development (OECD) peer countries (Kim, 2013). Each percentage increase in public expenditure reduces infant mortality by 0.077% and increases life expectancy by 0.026 years. UHC is a functional and effective way to drastically increase the proportion of public health spending.

In addition to improving coverage, quality of healthcare, and health outcomes, UHC is also effective at reducing waste and cost in the health system. A 30-year examination of OECD countries that implemented a single payer system (controlling for health status, demographics, level of preventative medicine, and political factors) showed a difference in cost of .75% of GDP, estimated at 150$ billion per year in the US (Bichay, 2020). Half of the saved cost is due to reduced cost of medical goods and administrative spending (0.37% GDP) and most of the rest is due to improved health outcomes (0.2% GDP). Current waste in the US system due to administrative costs could be reduced by 33-53% with the adoption of UHC (Scheinker, 2021). Moreover, centralization due to UHC allows for savings from improved information aggregation and analysis. The Taiwanese National Healthcare Insurance Administration has used statistical modeling to identify outlier health providers, leading to an 8% reduction in expenditures within their first two years of operation by controlling fraud and abuse (Hsiao, 2016). Additionally, while the US uses 10% fewer drugs per capita than other OECD countries, prices are 50% higher for equivalent drugs (Manchikanti, 2009). An extreme example can be found when looking at recent price spikes in the US for toxoplasmosis drugs (a 5,500% increase) and EpiPens (a 791% increase), which did not occur in Europe or Canada. Countries implementing single-payer systems have lower average pharmaceutical costs, due to lower pharmaceutical prices and prioritization of effective generic alternatives to expensive brand-name drugs (Morgan, 2017). By creating a functional single buyer market, UHC is effective at limiting aggregate costs across the board in both healthcare goods and technologies (Hussey, 2003).

## Opposition and Support to Universal Health Care

Opposition to UHC in the United States commonly originates due to an inability to understand UHC. In Americans that oppose UHC, approximately half were unable to understand the structure of the Affordable Care Act (ACA) or its component pieces (Barcellos 2013; Kaiser Family Foundation Health Tracking Poll 2011). Furthermore, misinformation regarding UHC is extremely common, as over 60% of Americans cited television as their primary source of information about the ACA (a step towards UHC). Plainly untrue statements were propagated, such as calling the ACA “socialism” or “a seizure of one sixth of the economy” (Skidmore, 2012). Television advertisements originating from Republican candidates in 2012 and 2014 painted an immensely negative picture of UHC, which was possible in part due to lack of information (Dalen 2015). Appraising a more narrow population, Huebner and colleages (2006) examined how US medical students feelings towards UHC change from their first to their fourth year. Medical student focus groups struggled to come to consensus on terms related to UHC such as “fee for service,” “managed care,” “single-payer,” “multi-payer,” and “universal health care”. This inability to come to consensus illustrates a lack of understanding UHC. Furthermore, the authors note that ‘complex policy terms’ were not able to be defined in the questionnaire, indicating a need to explain the concepts of UHC in a simpler fashion. Academic understanding and analysis of UHC has also been harmed due to a lack of a shared etymology (Hsiao 2016). Additionally, belief that UHC would make the healthcare more comprehensible is strongly correlated with willingness to support UHC (Holahan 2019). 89.4% of those that support UHC believe that UHC would make health care simpler and easier, where only 50% of those that oppose UHC believe the same.

Another common source for opposition to UHC in the US is the perception that UHC is inequitable. Belief that UHC would lead to equitable coverage is strongly correlated with support for UHC. 91% of those that support UHC believe that equitable coverage is important, while only 45% of those that oppose UHC believe the same (Holahan 2019). Furthermore, when Shen and colleagues (2016) examined the impact of racism on support for UHC, they found that perceived inequity was the mechanism through which racism impacted support for UHC. The authors hypothesized that Whites opposed government programs designed to eliminate racial inequity because it constituted unjust government assistance. While UHC is not designed to specifically benefit Blacks, individuals harboring racist beliefs may assume that is the case. Crucially, whether the individual purported to benefit from UHC was a ‘free-rider’ (inequitably benefitting from UHC) was what predicted opposition to UHC. This was unrelated to race. However, racial disparities do indeed exist regarding support for healthcare reform (Byrd et al., 2011). A larger proportion of Blacks (78.6%), Latinos (52.6%), and other minorities (43.6%) supported health reform compared to Whites (38.4%). Previous literature also indicates that Blacks and Whites have different perceptions on whether race affects individual health outcomes, with over half of Blacks believing that race impacts individual health outcomes, and over half of Whites having no opinion or believing the opposite (Lillie-Blanton et al., 2000). Plausibly, the perception that UHC would improve equity in outcomes drives support for UHC in Blacks compared to Whites. This illustrates the importance of perceived equity on support for UHC. Determining how address both perceptions of equity and develop an accurate understanding of UHC to improve support is a challenge.

## Previous US Attempts towards UHC

There have been several attempts to implement UHC in the United States at the state level (e.g. California, Washington, Florida, etc.); however, none have been successful to date. In 2011, the local legislature in the state of Vermont enacted a bill guaranteeing UHC for all Vermont residents (State of Vermont Health Care Financing Plan Beginning Calendar Year 2017 Analysis, 2013). This bill, known as “Green Mountain Care”, was perceived as both a tool to improve health outcomes in Vermont and a way to reduce medical costs and strengthen the economy. Three different independent organizations projected this to be the case, with a consensus that immediate healthcare costs for Vermont would be lowered by 8-12% and another 12-14% over the next 10 years (Hsiao, 2011; Green Mountain Care Financing Report, 2014; State of Vermont Health Care Financing Plan Beginning Calendar Year 2017 Analysis, 2013). Combined with the fact that cost increases were estimated to be only 9.4% for employers and 3.1% for individuals, total savings across the system were estimated to be $378 million over 5 years. Difficulties arose in implementation however, due to a combination of reduced federal revenue and increased scope of coverage to nonresidents working in Vermont (McDonough 2015). The plan was eventually abandoned in 2014, not due to lack of public support, but instead due to proportionally larger taxes on business and an inability to convey that these taxes would functionally replace current premium costs (Fox 2015).

Oregon is another state where UHC expansion has been debated and examined. The Oregon Medicaid lottery in 2008 was the first time in the US where a randomized controlled study on UHC was possible. Data from roughly 6,000 adults who were selected to apply for Medicaid, and 6,000 who were not, allowed for objective evaluation (Baicker, 2013). Researchers found no significant improvements over a two year period in direct measurements of health, such as blood pressure, cholesterol, blood sugar, tobacco use, or obesity (James 2015). However, significant benefits arose in the form of greater management for continuing conditions, lower depression, and most significantly, an almost complete elimination of catastrophic out of pocket medical expenses, leading to lower medical debt. The primary concern from critics were concerns that objective health outcomes saw no improvement, and that while self-reported health did show significant improvement, it was less important given the inherent noise in self-reported data. Given these concerns, UHC was seen as politically infeasible, even though 62% of Oregon voters would “definitely” or “probably” support a UHC plan that would double or triple state taxes (Rosenberg 2020).

## Possible Interventions

Increasing support for UHC has been the focus of many interventions in the past few decades, both in terms of academic research, as well as political policy intended to improve likelihood of UHC implementation. In the US, Sanchez and colleagues (2016) found that for American Latinos, support for UHC was strongly impacted by the saliency of ‘linked fate’. Defined simply, ‘linked fate’ is the question of if, or how much, an individual Latino believes their success depends on the success of other Latinos. Latinos that expressed ‘a lot’ of belief in shared fate were significantly more likely than those with no belief in shared fate to support UHC (60% vs. 43%).

Conversely, Knoll and colleagues (2015) have found that increased saliency and belief in ‘Nativism’, defined as the perception that foreign influence despoils traditional American heritage, predicts opposition to health care reform. Surprisingly, this holds true for both Republicans and Democrats. Additionally, this was after controlling for partisanship, ideology, and racial resentment, which all had independent significant effects on support for health care reform. The total effect was that strongly nativist beliefs lead to a 35.5% reduction in belief that health reform was at least favorable or ambivalent, compared to those with strongly non-nativist beliefs.

Many governments have had success with interventions designed to lead to implementation of UHC. The strategy that Turkey utilized from 2002 to 2013 was to directly address the primary concerns of entrenched stakeholders opposing UHC, while also quickly building public support for UHC by focusing on conspicuous changes to their health system (Bump et al., 2014). Ceasing the practice of holding patients in the hospital until their bills were fully paid, increasing patient capacity in hospitals, and increasing the fleet of emergency vehicles by 3 to 5 fold over the course of 10 years lead to increased satisfaction with health services, from 39.5% in 2003 to 75.9% in 2011 (Atun et al., 2015). This momentum manifested itself as improved public support for the reforms and greater electoral support for the AK party (which implemented the reforms), giving them the political power to impose greater changes towards UHC. The second focus of their strategy was to directly address the concerns of the two main organized groups opposing UHC implementation. Trade unions believed that their benefits would decrease under UHC, and the system would be fundamentally inequitable. The Turkish government responded by increasing the scope and scale of coverage, leading to support from trade unions. Healthcare workers were concerned that increased demand from the public sector would drive down salaries. The Turkish government directly addressed these concerns by providing incentives for better service, linking pay to satisfaction and quantity of work, generally leading to dramatic pay increases for those working in the public sector. Likewise, the government of Rwanda implemented several interventions in mid-2011 in order to achieve a truly sustainable UHC system (Makaka et al., 2012). Government financing of regions in Rwanda was directly tied to proportion of health coverage in a district, directly incentivizing local leaders to improve enrollment percentages. Rwanda also had a highly successful wealth categorization system meant to ensure that the most vulnerable citizens were enrolled. Wealth categorization was decided collectively per citizen by members of their village, based on ability to work, assets, and income. These changes lead to 90% insurance coverage in Rwanda by 2012. It is important to note that the strategies that Turkey and Rwanda utilized were successful in part because they were adapted to the very specific needs and abilities of their localities and may not possibly translate effectively to other contexts.

## Health Benefits Packages

A potential intervention that has not yet been examined in the literature is presenting UHC through the framework of a health benefits package (HBP). A HBP is defined by three factors (Glassman et al., 2016). First, HBPs are a comprehensive portfolio of services (e.g., dental, mental health, pharmaceuticals) as compared to programs that only cover a single service (e.g., GoodRx and pharmaceuticals). This allows assessment of cost effectiveness by allowing several types of services to be directly compared to one another. Second, HBPs are designed and priced using actuarially informed estimates of supply and demand. Third, HBPs constrain the services made available through the public health system, but by doing so, guarantee that at least certain services will be made available.

In the American system of health care, many experts agree that efficiency and quality of care are unlikely to be improved without an HBP like system, combining a well-defined framework with the legal specificity necessary for regulation (Chalkidou, Marquez, and Dhillon et al., 2014). Since HBPs create explicit entitlements for patients, they reduce confusion as to what is being offered. Furthermore, HBPs help ensure fairness and equity by preventing discretionary variation in access to care that would otherwise be largely determined by clinical professionals. In countries with UHC without an HBP linked to cost, there are significant gaps in coverage, implicit rationing, and with consequently lower quality healthcare outcomes (e.g. higher infant mortality, greater spread of communicable disease) . For example, Uganda has intended to guarantee UHC to all citizens since 1999 (Odokonyero et al., 2017). However, by 2017, only 52% of their poorest, and 69% of their wealthiest citizens had coverage. Inefficient concentration of resources in urban areas lead to implicit rationing of comprehensive coverage for most Ugandans, living in rural areas without easy access to transportation. Another parallel can be found in Ghana’s National Health Insurance Scheme (Agyepong et al. 2016). Implemented in 2003 to provide UHC, by 2016 only 40% of the population had coverage. Critically, enrollment had stagnated due citizen unhappiness with the system, due to frequent stock-outs of pharmaceuticals, unequal enforcement of regulations, and the perception that certain minority groups benefited inequitably. Clear evidence exists that lacking an HBP in several countries has resulted in an ineffective attempt at achieving UHC, both in citizen perception, and wholeness of coverage.

Conversely, countries that have UHC with an HBP are perceived as well functioning. For example, 78% of Swiss citizens surveyed perceived their HBP based system as one that is fair for the ill, due to a combination of appropriate levels of coverage, equal protection to all Swiss citizens, and increased knowledge about the health system (Hurst 2018). As another example, when a HBP was used to examine different configurations of Medicare benefits in the U.S., 83% of studied enrollees agreed that the consensus plan provided was fair (Danis 2004). Furthermore, 66% agreed strongly, and a further 30% agreed somewhat that the HBP was easy to understand. Most importantly, 86% of participants believed that the presented HBP was one they were satisfied with. Presenting otherwise complex trade-offs of health benefits in a simple, easy to understand fashion was extremely beneficial.

Emphasizing the necessary nature of tradeoffs or compromises in medical care and doing so in a clear and easy to understand way is vital. Developed by Goold and colleagues (2000), the Choosing Healthplans All Together intervention was designed to explain HBPs clearly by directly addressing these concerns. The central tenet of the CHAT exercise is for participants to construct their own HBP by allocating a limited set of resources to benefit types (e.g., dental, fertility treatments, long-term care) and choosing scope of coverage (e.g., generics instead of name-brand drugs, amount of copayments, etc.). The purpose of the exercise was initially to help explain how trade-offs in medicine are necessary, as well as to determine what the subjects prioritize in healthcare given limited resources. Conveniently, the final chosen plan is clear and explicit in what care is offered and at what level, neatly answering the issue of consumer confusion at the specifics.

The CHAT exercise has been a successful method of explain how HBPs are constructed, with over 95% of participants finding the task easy to do across several different implementations of the exercise (Danis, Biddle, and Goold, 2002; Danis,2002; Danis, 2004). CHAT has also been adapted twice to explore trade-offs in specific government funded health plans. First, Danis and colleagues (2004) used the CHAT framework to illustrate the financial constraints of government funded Medicare and to assist Medicare enrollees in developing a consensus on what services they want to prioritize. Participants first individually went through the CHAT exercise, then were grouped with approximately 12 participants each; These groups engaged in CHAT, with options being decided by simple majority votes, to reach a consensus HBP. While 41% of participants felt that the HBP designed as a group was different than what they would have chosen for themselves, 86% were still satisfied with the HBP they developed. The second adaptation, by Hurst, Schindler, and Goold (2018), was used to examine how Swiss citizens would prioritize types of care in the already extant Swiss HBP based UHC system. The participants had no trouble using the exercise to improve their understanding of the Swiss HBP, were easily able to make trade-offs and set priorities, and found that they were able to reach a strong consensus. This was exceptionally valuable due to the diversity of opinions observed in the study.

It is important to note that the CHAT exercise is particularly valuable because it is a hands-on exercise as compared to a simple informational intervention. Work by Wegier and colleagues (2019) found that a simulated experience led to more accurate understanding of information as compared to simply being given explicitly described statistics. Furthermore, active instruction is particularly time efficient and engaging when learning complex, numeracy-focused material (Haidet, 2004). Active instruction is also particularly effective at improving subject-specific knowledge gains (Michel, 2009). These characteristics are an ideal match for the material presented in an HBP. Thus, it is reasonable to believe that active instruction will be more effective than a simple ‘fact sheet’ for an HBP that would otherwise be presented to the public.

## The Present Research

The goal of our two studies is to determine whether exposure to UHC through the framework of an HBP can improve support for UHC. Based on previous research, we know that UHC is likely to benefit the US if implemented, and that HBP directly addresses some of the primary reasons that are foundational to opposition of UHC. Regardless, no direct research has been done previously on the effects of HBP on UHC or the impact of passive versus active learning in this context.