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ECONOMIC EVALUATIONS OF DIGITAL THERAPEUTICS (DTX) FROM A US PERSPECTIVE

Sandman K, Vieweg DC, Forsythe A
Purple Squared Economics, New York, NY, USA

Objectives: DTX represent a potentially transformative approach to support self-management of chronic conditions and to complement conventional disease monitoring and treatment. While DTX have not yet notably impacted patient care or service delivery in the US, these technologies have the potential to increase efficiency, improve outcomes, and expand access to care while reducing costs. In the absence of a large body of published research or consensus guidelines on DTX, US payers have posed questions about how to determine whether the effectiveness of a DTX merits the time, effort, and costs of utilizing the technology. We therefore sought to identify economic evaluations of DTX from the US perspective.

Methods: A strategic literature review was conducted using the PubMed and Embase databases, wherein core publications were identified using an initial PubMed search strategy with the MeSH term “mobile applications/economics.” Of 46 publications identified, two core publications were used to establish keywords and for bibliographic and prospective citation searches to identify additional relevant publications. ISPOR and AMCP congress abstracts also were searched from 2018 to 2020.

Results: Our search identified ten US-focused economic evaluations of DTX. Therapeutic areas included general mental health (1), depression (1), opioid use disorder (2), eating disorders (1), and diabetes (5, including 1 with hypertension). Five studies were cost-utility analyses (one also included a cost-effectiveness (CEA) and budget impact model), and the remaining 5 studies included 3 CEAs and 2 cost-consequence models. Model horizons ranged from 3 months to 10 years, with longer-term models demonstrating higher quality-adjusted life year gains and cost savings.

Conclusions: DTX represent an emerging opportunity to reduce healthcare expenditures while empowering patients and improving outcomes, but the existing evidence base is sparse. There are relatively few economic evaluations of DTX from the US perspective, presenting a challenge to payers seeking to develop coverage policies for this novel treatment modality.

No Specific Disease - Medical Technologies

PN585

ECONOMIC EVALUATIONS OF DIGITAL THERAPEUTICS (DTX) FROM A US PERSPECTIVE

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Purple Squared Economics, New York, NY, USA

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No Specific Disease - Methodological & Statistical Research

PN586

HOW US CLINICAL TRIALS ARE BEING REIMAGINED IN A COVID-19 WORLD

Nielsen C, Infante K, Eslamni N, Garfield S
Ernst & Young, New York, NY, USA, 2Ernst & Young, Malden, MA, USA, 3Ernst & Young, Wayland, MA, USA

Objectives: As researchers have focused on finding effective treatments and vaccines for COVID-19, clinical trials for other studies in the US face an abrupt new reality that raises critical questions about how to continue their clinical programs. This metaanalysis assesses the fundamental, logistical and behavioral barriers to continuing clinical research during the pandemic and discusses their short- and long-term implications for the research environment. A comprehensive review of clinical research articles and regulations was conducted to understand the changing landscape of non-COVID-19 US clinical trials during the pandemic. Results: Impacts to clinical trial execution include heightened risk of patient drop out, study noncompliance and reduced patient enrollment. New patient enrollment year-over-year was down 65% worldwide in March 2020. Digital capabilities including teledmedicine visits, remote monitoring, eConsent and data collection tools are being used in response to these challenges. Conclusions: While many of these enablers are not novel – the FDA, for example, recommended a shift to remote monitoring for clinical trials back in 2013 – they have not yet been widely adopted. The COVID-19 environment, however, has accelerated the adoption of new technologies and heightened the focus on patient data protection. In turn, it has presented an opportunity for sponsors, sites and investigators alike to optimize the research business model, deliver value more efficiently and expand trial access. Amid the uncertainty brought on by the COVID-19 pandemic, organizations that invest in a participant-first approach that capitalizes on new methods of delivery will be well-poised to realize time and cost savings, patient safety improvements and participant diversity increases – now and in the long-term, beyond COVID-19.

PN587

CLASSIFYING HIGH MEDICAL EXPENDITURE PATIENTS USING LOGISTIC REGRESSION AND RANDOM FOREST

Menon J
Laris, Aarhus, Denmark

Objective: This study classified total medical expenditures of patients into high costs and non-high costs categories using two machine learning methods (logistic regression and random forest).

Methods: Data from the Medical Expenditure Panel Survey (MEPS) in 2018 was used for analyses. High-cost patients were identified with thresholds of 10X, 20X, and 33.3% of total medical expenditures. Predictor variables were selected based on prior review and included demographics, presence of co-morbid diseases and insurance related (Medicare, Medicaid and private) healthcare costs. Missing or inapplicable data on any of the variables were excluded. Logistic regression and random forest based classifiers were trained on a random subset (80%) of the data using MATLAB R2020b. Five-fold cross validation was used to prevent overfitting of the trained models. The two classification models were compared on metrics including accuracy, area under curve (AUC), specificity and sensitivity.

Results: From a total of 30,461 individuals, 21,648 individuals were included after removing individuals with missing data. The training dataset...