## Health Status

**1-Effects of Malnutrition on the Immune System and Infection and the Role of Nutritional Strategies Regarding Improvements in Children's Health Status: A Literature Review**

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**By Morales, F (Morales, Fatima) [1] , [2] ; Montserrat-de la Paz, S (Montserrat-de la Paz, Sergio) [3] , [4] ; Leon, MJ (Leon, Maria J.) [5] ; Rivero-Pino, F (Rivero-Pino, Fernando) [3] , [4]**
**(provided by Clarivate) Source NUTRIENTS Volume 16 Issue 1 DOI 10.3390/nu16010001 Article Number 1 Published JAN 2024 Indexed 2024-01-20 Document Type Review**

**Abstract**

Malnutrition refers to a person's status as under- or overnourished, and it is usually associated with an inflammation status, which can subsequently imply a different health status, as the risk of infection is increased, along with a deterioration of the immune system. Children's immune systems are generally more susceptible to problems than adults. In the situation of malnutrition, because malnourished children's immune systems are compromised, they are more likely to die. However, little is known about the underlying mechanism of altered immune functioning and how it relates to starvation. Nutritional interventions have been reported as cost-effective strategies to prevent or treat the development of malnourishment, considering the link between food intake and health, especially in children, and also the susceptibility of this population to diseases and how their health status during childhood might affect their long-term physiological growth. The ingestion of specific nutrients (e.g., vitamins or oligoelements) has been reported to contribute to the proper functioning of children's immune systems. In this review, we aim to describe the basis of malnutrition and how this is linked to the immune system, considering the role of nutrients in the modulation of the immune system and the risk of infection that can occur in these situations in children, as well as to identify nutritional interventions to improve their health.

**Keywords**
**Author Keywords**
childrenimmunonutritionimmunometabolisminfectionnutraceuticals

**Keywords Plus**
VITAMIN-A SUPPLEMENTATIONLIFE-STYLE INTERVENTIONEARLY INFANCYOVERWEIGHTWEIGHTINFLAMMATIONMANAGEMENTINCREASESOBESITYIMPACT

## Health Status

**2-Hybrid multimodal wearable sensors for comprehensive health monitoring**

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**By Mahato, K (Mahato, Kuldeep) [1] ; Saha, T (Saha, Tamoghna) [1] ; Ding, SC (Ding, Shichao) [1] ; Sandhu, SS (Sandhu, Samar S.) [1] ; Chang, AY (Chang, An-Yi) [1] ; Wang, JS (Wang, Joseph) [1] (provided by Clarivate)** **Source NATURE ELECTRONICS DOI 10.1038/s41928-024-01247-4 Early Access SEP 2024 Indexed 2024-09-29 Document Type Review; Early Access**

**Abstract**

Wearable bioelectronic sensors are often used for health monitoring but are typically limited to a few physical or chemical parameters, which hinders their ability to provide a complete health assessment. Recently, wearable sensor platforms have been developed that can simultaneously and continuously record multiple biophysical and biochemical signals. These devices take advantage of advances in electronic device fabrication and miniaturization, bioelectronic sensors, and flexible materials. However, compared with existing wearable systems, which mostly contain either biochemical or biophysical sensors, hybrid multimodal wearable patches present a number of distinct challenges for further advancement. Here, we examine the development of such hybrid multimodal wearable sensors and explore their potential applications in tracking the health and disease status of different users. We highlight the key biomarkers and vital signs (related to various pathophysiological conditions) that hybrid bioelectronic sensor systems must be designed around. We also explore how artificial intelligence could be integrated with these hybrid multimodal sensors to offer wearers the ability to assess their health status in real time.

This Review examines the development and potential of wearable sensor systems that use multiple physical and chemical sensing modalities to assess human health.

**Keywords**

**Keywords Plus**

ELECTROCHEMICAL GLUCOSE SENSORSDIABETES MANAGEMENTVITAL SIGNSREAL-TIMEBIG DATACHALLENGESBIOSENSORSDISCOVERYSEPSIS

## Health Status

### 3-Transcatheter Valve Repair in Heart Failure with Moderate to Severe Mitral Regurgitation

**By Anker, SD (Anker, Stefan D.) [1] , [2] , [6] , [7] ; Friede, T (Friede, Tim) [8] ; von Bardeleben, RS (von Bardeleben, Ralph-Stephan) [12] ; Butler, J (Butler, Javed) [27] , [28] ; Khan, MS (Khan, Muhammad-Shahzeb) [28] , [29] , [30] ; Diek, M (Diek, Monika) [1] , [2] , [6] , [7] ; Heinrich, J (Heinrich, Jutta) [9] ; Geyer, M (Geyer, Martin) [12] ; Placzek, M (Placzek, Marius) [8] ; Ferrari, R (Ferrari, Roberto) [31] ; Group Author RESHAPE-HF2 Investigators (RESHAPE-HF2 Investigators) (provided by Clarivate)** **Source NEW ENGLAND JOURNAL OF MEDICINE Volume 391 Issue 19 Page 1799-1809 DOI 10.1056/NEJMoa2314328 Published NOV 14 2024 Early Access AUG 2024 Indexed 2024-10-15 Document Type Article**

**Abstract**

BACKGROUND
Whether transcatheter mitral-valve repair improves outcomes in patients with heart failure and functional mitral regurgitation is uncertain.
METHODS
We conducted a randomized, controlled trial involving patients with heart failure and moderate to severe functional mitral regurgitation from 30 sites in nine countries. The patients were assigned in a 1:1 ratio to either transcatheter mitral-valve repair and guideline-recommended medical therapy (device group) or medical therapy alone (control group). The three primary end points were the rate of the composite of first or recurrent hospitalization for heart failure or cardiovascular death during 24 months; the rate of first or recurrent hospitalization for heart failure during 24 months; and the change from baseline to 12 months in the score on the Kansas City Cardiomyopathy Questionnaire-Overall Summary (KCCQ-OS; scores range from 0 to 100, with higher scores indicating better health status).
RESULTS
A total of 505 patients underwent randomization: 250 were assigned to the device group and 255 to the control group. At 24 months, the rate of first or recurrent hospitalization for heart failure or cardiovascular death was 37.0 events per 100 patient-years in the device group and 58.9 events per 100 patient-years in the control group (rate ratio, 0.64; 95% confidence interval [CI], 0.48 to 0.85; P=0.002). The rate of first or recurrent hospitalization for heart failure was 26.9 events per 100 patient-years in the device group and 46.6 events per 100 patient-years in the control group (rate ratio, 0.59; 95% CI, 0.42 to 0.82; P=0.002). The KCCQ-OS score increased by a mean (+/- SD) of 21.6 +/- 26.9 points in the device group and 8.0 +/- 24.5 points in the control group (mean difference, 10.9 points; 95% CI, 6.8 to 15.0; P<0.001). Device-specific safety events occurred in 4 patients (1.6%).
CONCLUSIONS
Among patients with heart failure with moderate to severe functional mitral regurgitation who received medical therapy, the addition of transcatheter mitral-valve repair led to a lower rate of first or recurrent hospitalization for heart failure or cardiovascular death and a lower rate of first or recurrent hospitalization for heart failure at 24 months and better health status at 12 months than medical therapy alone.

**Keywords**

**Health Status**

**Keywords Plus**

PERCUTANEOUS REPAIRLESSONS

## Health Status

# 4-Intelligent Wearable Systems: Opportunities and Challenges in Health and Sports

**By Yang, LY (Yang, Luyao) [1] ; Amin, O (Amin, Osama) [1] ; Shihada, B (Shihada, Basem) [1]**
**(provided by Clarivate) Source ACM COMPUTING SURVEYS Volume 56 Issue 7 DOI 10.1145/3648469 Article Number 190 Published JUL 2024 Indexed 2024-07-01 Document Type Article**

**Abstract**

Wearable devices, or wearables, designed to be attached to the human body, can gather personalized real-time data and continuously monitor an individual's health status and physiological disposition in a non-invasive manner. Intelligent wearables integrate advanced machine learning algorithms to process complex data patterns and provide accurate insights. As a result, intelligent wearables have emerged as a ground-breaking innovation in the fields of sports and health, introducing a new paradigm in kinematic analysis and patient data evaluation. For example, virtual coaches offer feedback on athletes' performance, whereas virtual physicians assist in customizing medication for patients. This article provides an overview of various types of intelligent wearables and their applications in health and sports, categorizes machine learning algorithms, and introduces the wireless body area sensor network (WBASN) used for communication in wearable sensors. Additionally, we discuss potential challenges and development directions that could shape the future of intelligent wearables and propose effective solutions for their continued enhancement. This article offers valuable insights into the exciting potential of intelligent wearables to transform healthcare and sports.

**Keywords**
**Author Keywords**
Artificial intelligencemachine learningwearableshealthsports

**Keywords Plus**
PARKINSONS-DISEASEINFORMATION FUSIONDIGITAL TWINSENSORWIRELESSCLASSIFICATIONRECOGNITIONGAITPREDICTIONNETWORKS

## Health Status

# 5-Fusaric acid mediates the assembly of disease-suppressive rhizosphere microbiota via induced shifts in plant root exudates

**By Jin, X (Jin, Xue) [1] ; Jia, HT (Jia, Huiting) [1] ; Ran, LY (Ran, Lingyi) [1] ; Wu, FZ (Wu, Fengzhi) [1] ; Liu, JJ (Liu, Junjie) [2] ; Schlaeppi, K (Schlaeppi, Klaus) [3] ; Dini-Andreote, F (Dini-Andreote, Francisco) [4] , [5] , [6] ; Wei, Z (Wei, Zhong) [7] ; Zhou, XG (Zhou, Xingang) [1] (provided by Clarivate)**
**Source NATURE COMMUNICATIONS Volume 15 Issue 1 DOI 10.1038/s41467-024-49218-9 Article Number 5125 Published JUN 15 2024 Indexed 2024-06-27 Document Type Article**

**Abstract**

The plant health status is determined by the interplay of plant-pathogen-microbiota in the rhizosphere. Here, we investigate this tripartite system focusing on the pathogen Fusarium oxysporum f. sp. lycopersici (FOL) and tomato plants as a model system. First, we explore differences in tomato genotype resistance to FOL potentially associated with the differential recruitment of plant-protective rhizosphere taxa. Second, we show the production of fusaric acid by FOL to trigger systemic changes in the rhizosphere microbiota. Specifically, we show this molecule to have opposite effects on the recruitment of rhizosphere disease-suppressive taxa in the resistant and susceptible genotypes. Last, we elucidate that FOL and fusaric acid induce changes in the tomato root exudation with direct effects on the recruitment of specific disease-suppressive taxa. Our study unravels a mechanism mediating plant rhizosphere assembly and disease suppression by integrating plant physiological responses to microbial-mediated mechanisms in the rhizosphere.

The phytotoxin fusaric acid produced by the phytopathogen Fusarium oxysporum f. sp. lycopersici results in a differential assembly of the rhizosphere microbiota of resistant and susceptible genotypes with implication for disease suppression.

**Keywords**

**Keywords Plus**

OXYSPORUMRESISTANCEDIVERSITYDEFENSETOMATOPCR

## Health Status

### 6-The Application of Deep Learning in the Whole Potato Production Chain: A Comprehensive Review

**By Wang, RF (Wang, Rui-Feng) [1] ; Su, WH (Su, Wen-Hao) [1] (provided by Clarivate)** **Source AGRICULTURE-BASEL Volume 14 Issue 8 DOI 10.3390/agriculture14081225 Article Number 1225 Published AUG 2024 Indexed 2024-09-13 Document Type Review**

**Abstract**

The potato is a key crop in addressing global hunger, and deep learning is at the core of smart agriculture. Applying deep learning (e.g., YOLO series, ResNet, CNN, LSTM, etc.) in potato production can enhance both yield and economic efficiency. Therefore, researching efficient deep learning models for potato production is of great importance. Common application areas for deep learning in the potato production chain, aimed at improving yield, include pest and disease detection and diagnosis, plant health status monitoring, yield prediction and product quality detection, irrigation strategies, fertilization management, and price forecasting. The main objective of this review is to compile the research progress of deep learning in various processes of potato production and to provide direction for future research. Specifically, this paper categorizes the applications of deep learning in potato production into four types, thereby discussing and introducing the advantages and disadvantages of deep learning in the aforementioned fields, and it discusses future research directions. This paper provides an overview of deep learning and describes its current applications in various stages of the potato production chain.

**Keywords**
**Author Keywords**
potatodeep learningpest and diseasesyield predictionwater and nutrient management

**Keywords Plus**
EXTERNAL
DEFECTSALGORITHMMODELCLASSIFICATIONOPTIMIZATIONPREDICTIONCULTIVARSFEATURESNETWORK
CROP

## Health Status

**7-Wearable Collar Technologies for Dairy Cows: A Systematized Review of the Current Applications and Future Innovations in Precision Livestock Farming**

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**By Lamanna, M (Lamanna, Martina) [1] ; Bovo, M (Bovo, Marco) [2] ; Cavallini, D (Cavallini, Damiano) [1] (provided by Clarivate)** **Source ANIMALS Volume 15 Issue 3 DOI 10.3390/ani15030458 Article Number 458 Published FEB 2025 Indexed 2025-02-17 Document Type Review**

**Abstract**

Wearable collar technologies have become integral to the advancement of precision livestock farming, revolutionizing how dairy cattle are monitored in terms of their behaviour, health status, and productivity. These devices leverage cutting-edge sensors, including accelerometers, RFID tags, GPS receivers, microphones, gyroscopes, and magnetometers, to provide non-invasive, real-time insights that enhance animal welfare, optimize resource use, and support decision-making processes in livestock management. This systematized review focuses on analyzing the sensors integrated into collar-based systems, detailing their functionalities and applications. However, significant challenges remain, including the high energy consumption of some sensors, the need for frequent recharging, and limited parameter coverage by individual devices. Future developments must focus on integrating multiple sensor types into unified systems to provide comprehensive data on animal behaviour, health, and environmental interactions. Additionally, advancements in energy-efficient designs, longer battery life, and cost-reduction strategies are essential to enhance the practicality and accessibility of these technologies. By addressing these challenges, wearable collar systems can play a pivotal role in promoting sustainable, efficient, and responsible livestock farming, aligning with global goals for environmental and economic sustainability. This paper underscores the transformative potential of wearable collar technologies in reshaping the livestock industry and driving the adoption of innovative farming practices worldwide.

**Keywords**

**Author Keywords**

precision livestock monitoringsensor technologyanimal behaviour trackingsmart farmingdigital dairy management

**Keywords Plus**

ACTIVITY MONITORING-SYSTEMREPRODUCTIVE-PERFORMANCETRIAXIAL ACCELEROMETERSRUMINATION ACTIVITYESTROUS EXPRESSIONHOLSTEIN HEIFERSJAW MOVEMENTSGRASS INTAKEESTRUSPASTURE

## Health Status

**8-Prediction of bearing remaining useful life based on a two-stage updated digital twin**

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**By He, DQ (He, Deqiang) [1] ; Zhao, JY (Zhao, Jiayang) [1] ; Jin, ZZ (Jin, Zhenzhen) [1] , [4] ; Huang, CG (Huang, Chenggeng) [2] ; Zhang, F (Zhang, Fan) [3] ; Wu, JX (Wu, Jinxin) [1] (provided by Clarivate)**
**Source ADVANCED ENGINEERING INFORMATICS Volume 65 Part A DOI 10.1016/j.aei.2025.103123 Article Number 103123 Published MAY 2025 Early Access JAN 2025 Indexed 2025-02-20 Document Type Article**

**Abstract**

As a pivotal element in industrial production, bearings are vital for the smooth functioning of the system. It is essential to accurately predict the remaining useful life (RUL) of bearings. Yet, the present methods for predicting RUL do not consider the real-time health state of bearing operation, resulting in poor RUL prediction accuracy. This paper proposes a method for bearing RUL prediction, based on a two-stage updating digital twin and a dual- correlation dynamic graph convolutional network (DC-DGCN), to address the aforementioned problems. First, a bearing defect evolution model with outer ring defect expansion characteristics is established, and the initial defect expansion curve is obtained in the first stage using multi-objective optimization. This process achieves real-time interaction between the twin model and the real bearing. Then, the calibrated defects in the second stage are used to further update the full life cycle defect curve. Bi-directional Long Short-Term Memory (BiLSTM) is utilized to correlate the vibration characteristics of the real bearing with the twin defects to complete the real-time mapping. Finally, the mapped defects are incorporated into the feature space used for RUL prediction, allowing the proposed DC-DGCN method to extract correlations between physical and digital space features for the final prediction. The suggested method effectively increases the veracity of bearing RUL prediction, as the experimental results prove.

**Keywords**

**Author Keywords**

BearingRemaining useful lifeReal-time health statusDigital twinGraph convolutional network

**9-Cadmium Toxicity and Health Effects-A Brief Summary**

**By Charkiewicz, AE (Charkiewicz, Angelika Edyta) [1] ; Omeljaniuk, WJ (Omeljaniuk, Wioleta Justyna) [2] , [3] ; Nowak, K (Nowak, Karolina) [4] ; Garley, M (Garley, Marzena) [5] ; Niklinski, J (Niklinski, Jacek) [1] (provided by Clarivate)** **Source MOLECULES Volume 28 Issue 18 DOI 10.3390/molecules28186620 Article Number 6620 Published SEP 2023 Indexed 2023-10-26 Document Type Review**

**Abstract**

Cadmium (Cd) is a ductile metal in the form of a blueish or silvery-white powder. It is naturally found in soil (about 0.2 mg/kg), minerals, and water. Cd belongs to the group of toxic, carcinogenic, and stimulating elements. Its biological half-life in the human body ranges from 16 to even 30 years on average. Some lung diseases (such as emphysema, asthma, and bronchitis) and high blood pressure are thought to be related to slow poisoning. The symptoms of cadmium poisoning may vary depending on the time of exposure, the type of diet, and the age and health status of the exposed people. For non-smokers and non-occupational exposures, the only source of exposure is diet. The FAO/WHO recommends that the tolerable cadmium intake for an adult is approximately 0.4-0.5 mg/week (60-70 mu g per day). Cadmium is primarily absorbed through the respiratory system (about 13-19% of Cd from the air), but it can also enter through the digestive system (about 10-44%), when dust is mixed and swallowed with saliva. The amount of accumulated Cd ranges from 0.14 to 3.2 ppm in muscles, 1.8 ppm in bones, and 0.0052 ppm in the blood. People who are most frequently exposed to heavy metals should be continuously monitored in order to maintain a healthy lifestyle, as well as to implement effective preventive measures and improve public health.

**Keywords**
**Author Keywords**
cadmiumexposure and absorptiontoxic elementpoisoning and effects

**Keywords Plus**
ENVIRONMENTAL EXPOSUREOCCUPATIONAL-EXPOSUREHEAVY-METALSDNA-REPAIRRISKPOPULATIONCANCERRICEMETAANALYSISMECHANISMS

# 10-Advancing Precision Medicine: A Review of Innovative In Silico Approaches for Drug Development, Clinical Pharmacology and Personalized Healthcare

**By Marques, L (Marques, Lara) [1] , [2] , [3] ; Costa, B (Costa, Barbara) [1] , [2] , [3] ; Pereira, M (Pereira, Mariana) [1] , [2] , [4] ; Silva, A (Silva, Abigail) [1] , [2] , [5] ; Santos, J (Santos, Joana) [1] , [2] , [3] ; Saldanha, L (Saldanha, Leonor) [1] , [2] , [3] ; Silva, I (Silva, Isabel) [1] , [2] , [3] ; Magalhaes, P (Magalhaes, Paulo) [6] ; Schmidt, S (Schmidt, Stephan) [7] ; Vale, N (Vale, Nuno) [1] , [2] , [3] (provided by Clarivate)** **Source PHARMACEUTICS Volume 16 Issue 3 DOI 10.3390/pharmaceutics16030332 Article Number 332 Published MAR 2024 Indexed 2024-04-08 Document Type Review**

**Abstract**

The landscape of medical treatments is undergoing a transformative shift. Precision medicine has ushered in a revolutionary era in healthcare by individualizing diagnostics and treatments according to each patient's uniquely evolving health status. This groundbreaking method of tailoring disease prevention and treatment considers individual variations in genes, environments, and lifestyles. The goal of precision medicine is to target the "five rights": the right patient, the right drug, the right time, the right dose, and the right route. In this pursuit, in silico techniques have emerged as an anchor, driving precision medicine forward and making this a realistic and promising avenue for personalized therapies. With the advancements in high-throughput DNA sequencing technologies, genomic data, including genetic variants and their interactions with each other and the environment, can be incorporated into clinical decision-making. Pharmacometrics, gathering pharmacokinetic (PK) and pharmacodynamic (PD) data, and mathematical models further contribute to drug optimization, drug behavior prediction, and drug-drug interaction identification. Digital health, wearables, and computational tools offer continuous monitoring and real-time data collection, enabling treatment adjustments. Furthermore, the incorporation of extensive datasets in computational tools, such as electronic health records (EHRs) and omics data, is also another pathway to acquire meaningful information in this field. Although they are fairly new, machine learning (ML) algorithms and artificial intelligence (AI) techniques are also resources researchers use to analyze big data and develop predictive models. This review explores the interplay of these multiples in silico approaches in advancing precision medicine and fostering individual healthcare. Despite intrinsic challenges, such as ethical considerations, data protection, and the need for more comprehensive research, this marks a new era of patient-centered healthcare. Innovative in silico techniques hold the potential to reshape the future of medicine for generations to come.

**Keywords**
**Author Keywords**
precision medicinein silicoclinical pharmacologycomputational toolspatient-centered healthcare
**Keywords Plus**
POPULATION PHARMACOKINETIC PARAMETERSMASTER PROTOCOLSDECISION-MAKINGNEURAL NETWORKSBIOMARKERSMODELCHALLENGESPHARMACODYNAMICSPHARMACOMETRICSMANAGEMENT

## Health Status

**11-Two-Year Outcomes of Transcatheter Edge-to-Edge Repair for Severe Tricuspid Regurgitation: The TRILUMINATE Pivotal Randomized Controlled Trial**

**By Kar, S (Kar, Saibal) [1] ; Makkar, RR (Makkar, Raj R.) [2] ; Whisenant, BK (Whisenant, Brian K.) [3] ; Hamid, N (Hamid, Nadira) [4] ; Naik, H (Naik, Hursh) [5] ; Tadros, P (Tadros, Peter) [6] ; Price, MJ (Price, Matthew J.) [7] ; Singh, G (Singh, Gagan) [8] ; Schwartz, JG (Schwartz, Jonathan G.) [9] ; Kapadia, S (Kapadia, Samir) [10] ; Group Author TRILUMINATE Pivotal Investigators (TRILUMINATE Pivotal Investigators) (provided by Clarivate)** **Source CIRCULATION Volume 151 Issue 23 Page 1630-1638 DOI 10.1161/CIRCULATIONAHA.125.074536 Published JUN 10 2025 Indexed 2025-06-12 Document Type Article**

**Abstract**

BACKGROUND: One-year outcomes of TRILUMINATE Pivotal (Trial to Evaluate Cardiovascular Outcomes in Patients Treated With the Tricuspid Valve Repair System Pivotal) found that transcatheter edge-to-edge repair (TEER) for the treatment of severe, symptomatic tricuspid regurgitation improved quality of life compared with medical therapy alone with similar rates of mortality and heart failure hospitalization. However, additional follow-up is necessary to determine the prolonged benefits of tricuspid TEER. METHODS: A total of 572 patients with severe, symptomatic tricuspid regurgitation were randomized to either tricuspid TEER+medical therapy (device group) or medical therapy alone (control). Two-year prespecified end points were recurrent heart failure hospitalization and freedom from all-cause mortality, tricuspid valve surgery, and tricuspid valve intervention after treatment visit, assessed in the intention-to-treat population. RESULTS: The annualized rate of recurrent heart failure hospitalizations through 2 years was significantly lower with tricuspid TEER compared with control (0.19 event per patient-year versus 0.26 event per patient-year; P=0.02; joint frailty model hazard ratio, 0.72; one-sided upper confidence limit, 0.93; P=0.02). Freedom from all-cause mortality, tricuspid valve surgery, and tricuspid valve intervention through 2 years was significantly higher with tricuspid TEER compared with control (77.6% versus 29.3%; P<0.0001), driven by more tricuspid valve intervention in control patients who crossed over to device treatment (3.8% versus 61.5%). Rates of all-cause mortality (17.9% versus 17.1%) and tricuspid valve surgery (2.3% versus 4.3%) were similar between groups. Moderate or less tricuspid regurgitation was present in 84% at 2 years in the device group. CONCLUSIONS: At the 2-year follow-up, tricuspid TEER appeared safe, significantly reduced tricuspid regurgitation severity, and decreased rates of heart failure hospitalization compared with medical therapy alone.

**Keywords**
**Author Keywords**
hospitalizationtricuspid valve insufficiency

**Keywords Plus**
VALVE REGURGITATIONHEALTH-STATUSIMPACT

## Health Status

### 12-Transcatheter Aortic-Valve Replacement in Low-Risk Patients at Five Years

**By Mack, MJ (Mack, Michael J.) [1] ; Leon, MB (Leon, Martin B.) [2] , [3] , [13] ; Thourani, VH (Thourani, Vinod H.) [5] ; Pibarot, P (Pibarot, Philippe) [7] ; Hahn, RT (Hahn, Rebecca T.) [2] , [3] ; Genereux, P (Genereux, Philippe) [9] ; Kodali, SK (Kodali, Susheel K.) [2] , [3] ; Kapadia, SR (Kapadia, Samir R.) [11] ; Cohen, DJ (Cohen, David J.) [3] , [4] ; Pocock, SJ (Pocock, Stuart J.) [12] ; Group Author PARTNER 3 Investigators (PARTNER 3 Investigators) (provided by Clarivate)** **Source NEW ENGLAND JOURNAL OF MEDICINE Volume 389 Issue 21 Page 1949-1960 DOI 10.1056/NEJMoa2307447 Published NOV 23 2023 Early Access OCT 2023 Indexed 2023-11-01 Document Type Article**

**Abstract**

BackgroundA previous analysis in this trial showed that among patients with severe, symptomatic aortic stenosis who were at low surgical risk, the rate of the composite end point of death, stroke, or rehospitalization at 1 year was significantly lower with transcatheter aortic-valve replacement (TAVR) than with surgical aortic-valve replacement. Longer-term outcomes are unknown.MethodsWe randomly assigned patients with severe, symptomatic aortic stenosis and low surgical risk to undergo either TAVR or surgery. The first primary end point was a composite of death, stroke, or rehospitalization related to the valve, the procedure, or heart failure. The second primary end point was a hierarchical composite that included death, disabling stroke, nondisabling stroke, and the number of rehospitalization days, analyzed with the use of a win ratio analysis. Clinical, echocardiographic, and health-status outcomes were assessed through 5 years.ResultsA total of 1000 patients underwent randomization: 503 patients were assigned to undergo TAVR, and 497 to undergo surgery. A component of the first primary end point occurred in 111 of 496 patients in the TAVR group and in 117 of 454 patients in the surgery group (Kaplan-Meier estimates, 22.8% in the TAVR group and 27.2% in the surgery group; difference, -4.3 percentage points; 95% confidence interval [CI], -9.9 to 1.3; P=0.07). The win ratio for the second primary end point was 1.17 (95% CI, 0.90 to 1.51; P=0.25). The Kaplan-Meier estimates for the components of the first primary end point were as follows: death, 10.0% in the TAVR group and 8.2% in the surgery group; stroke, 5.8% and 6.4%, respectively; and rehospitalization, 13.7% and 17.4%. The hemodynamic performance of the valve, assessed according to the mean (+/- SD) valve gradient, was 12.8 +/- 6.5 mm Hg in the TAVR group and 11.7 +/- 5.6 mm Hg in the surgery group. Bioprosthetic-valve failure occurred in 3.3% of the patients in the TAVR group and in 3.8% of those in the surgery group.ConclusionsAmong low-risk patients with severe, symptomatic aortic stenosis who underwent TAVR or surgery, there was no significant between-group difference in the two primary composite outcomes. (Funded by Edwards Lifesciences; PARTNER 3 ClinicalTrials.gov number, NCT02675114.)

Among patients at low surgical risk who underwent TAVR or surgery, there was no apparent difference between groups in the incidence of the composite end point of death, stroke, or rehospitalization at 5 years.

**Keywords**

**Keywords Plus**

CLINICAL-TRIALSEND-POINTSOUTCOMES

## Health Status

### 13-Tirzepatide for Heart Failure with Preserved Ejection Fraction and Obesity

**By Packer, M (Packer, Milton) [1] , [2] ; Zile, MR (Zile, Michael R.) [3] , [4] ; Kramer, CM (Kramer, Christopher M.) [5] ; Baum, SJ (Baum, Seth J.) [6] ; Litwin, SE (Litwin, Sheldon E.) [3] , [4] ; Menon, V (Menon, Venu) [7] ; Ge, JB (Ge, Junbo) [8] ; Weerakkody, GJ (Weerakkody, Govinda J.) [9] ; Ou, Y (Ou, Yan g) [9] ; Bunck, MC (Bunck, Mathijs C.) [9] ; Group Author SUMMIT Trial Study Grp (SUMMIT Trial Study Grp) (provided by Clarivate)** **Source NEW ENGLAND JOURNAL OF MEDICINE Volume 392 Issue 5 Page 427-437 DOI 10.1056/NEJMoa2410027 Published JAN 30 2025 Indexed 2025-04-18 Document Type Article**

**Abstract**

BACKGROUND

Obesity increases the risk of heart failure with preserved ejection fraction. Tirzep-atide, a long-acting agonist of glucose-dependent insulinotropic polypeptide and glucagon-like peptide-1 receptors, causes considerable weight loss, but data are lacking with respect to its effects on cardiovascular outcomes.

METHODS: In this international, double-blind, randomized, placebo-controlled trial, we randomly assigned, in a 1:1 ratio, 731 patients with heart failure, an ejection fraction of at least 50%, and a body-mass index (the weight in kilograms divided by the square of the height in meters) of at least 30 to receive tirzepatide (up to 15 mg subcutaneously once per week) or placebo for at least 52 weeks. The two primary end points were a composite of adjudicated death from cardiovascular causes or a worsening heart-failure event (assessed in a time-to-first-event analysis) and the change from baseline to 52 weeks in the Kansas City Cardiomyopathy Questionnaire clinical summary score (KCCQ-CSS; scores range from 0 to 100, with higher scores indicating better quality of life).

RESULTS: A total of 364 patients were assigned to the tirzepatide group and 367 to the placebo group; the median duration of follow-up was 104 weeks. Adjudicated death from cardiovascular causes or a worsening heart-failure event occurred in 36 patients (9.9%) in the tirzepatide group and in 56 patients (15.3%) in the placebo group (hazard ratio, 0.62; 95% confidence interval [CI], 0.41 to 0.95; P= 0.026). Worsening heart-failure events occurred in 29 patients (8.0%) in the tirzepatide group and in 52 patients (14.2%) in the placebo group (hazard ratio, 0.54; 95% CI, 0.34 to 0.85), and adjudicated death from cardiovascular causes occurred in 8 patients (2.2%) and 5 patients (1.4%), respectively (hazard ratio, 1.58; 95% CI, 0.52 to 4.83). At 52 weeks, the mean (+/- SD) change in the KCCQ-CSS was 19.5 +/- 1.2 in the tirzepatide group as compared with 12.7 +/- 1.3 in the placebo group (between-group difference, 6.9; 95% CI, 3.3 to 10.6; P<0.001). Adverse events (mainly gastrointestinal) leading to discontinuation of the trial drug occurred in 23 patients (6.3%) in the tirzepatide group and in 5 patients (1.4%) in the placebo group.

CONCLUSIONS: Treatment with tirzepatide led to a lower risk of a composite of death from cardiovascular causes or worsening heart failure than placebo and improved health status in patients with heart failure with preserved ejection fraction and obesity.

**Keywords**

**Keywords Plus**

ADIPOSE-TISSUEINFLAMMATIONSEMAGLUTIDEWEIGHT

## Health Status

### 14-Global epidemiology of heart failure

**By Khan, MS (Khan, Muhammad Shahzeb) [1] ; Shahid, I (Shahid, Izza) [2] ; Bennis, A (Bennis, Ahmed) [3] ; Rakisheva, A (Rakisheva, Amina) [4] ; Metra, M (Metra, Marco) [5] , [6] ; Butler, J (Butler, Javed) [7] , [8] (provided by Clarivate)** **Source NATURE REVIEWS CARDIOLOGY Volume 21 Issue 10 Page 717-734 DOI 10.1038/s41569-024-01046-6 Published OCT 2024 Early Access JUN 2024 Indexed 2024-07-02 Document Type Review**

**Abstract**

Heart failure (HF) is a heterogeneous clinical syndrome marked by substantial morbidity and mortality. The natural history of HF is well established; however, epidemiological data are continually evolving owing to demographic shifts, advances in treatment and variations in access to health care. Although the incidence of HF has stabilized or declined in high-income countries over the past decade, its prevalence continues to increase, driven by an ageing population, an increase in risk factors, the effectiveness of novel therapies and improved survival. This rise in prevalence is increasingly noted among younger adults and is accompanied by a shift towards HF with preserved ejection fraction. However, disparities exist in our epidemiological understanding of HF burden and progression in low-income and middle-income countries owing to the lack of comprehensive data in these regions. Therefore, the current epidemiological landscape of HF highlights the need for periodic surveillance and resource allocation tailored to geographically vulnerable areas. In this Review, we highlight global trends in the burden of HF, focusing on the variations across the spectrum of left ventricular ejection fraction. We also discuss evolving population-based estimates of HF incidence and prevalence, the risk factors for and aetiologies of this disease, and outcomes in different geographical regions and populations.

In this Review, Khan and colleagues explore the evolving global epidemiology of heart failure (HF), focusing on changes in incidence and prevalence across the spectrum of left ventricular ejection fraction. The authors highlight the disparities in our understanding of HF epidemiology in low-income and middle-income countries, affirming the need for improved surveillance and resource allocation in vulnerable areas and populations.

Heart failure (HF) is a major global health concern, with an increasing prevalence driven by ageing populations, better treatment outcomes and improved survival.HF risk factors include advancing age, sex, inherited cardiomyopathies, hypertension, diabetes mellitus and obesity, highlighting the importance of targeted prevention strategies.Data from Europe and North America indicate a decline in the age-specific incidence of HF, with a notable shift towards HF with preserved ejection fraction among women, highlighting the evolving epidemiology of HF.The incidence and prevalence of HF and the mortality from HF are higher among Black individuals than in other racial or ethnic groups.Age-adjusted mortality in young adults (aged 15-44 years) increased from 2.36 in 1999 to 3.16 in 2019, a greater rise than in older adults (aged >= 75 years).Geographical disparities in epidemiological HF data, especially the deficit of data from Africa and South Asia, limit the development of targeted health-care strategies, public policy initiatives and interventions in these regions.

**Keywords**

**Health Status**

**Keywords Plus**

PRESERVED EJECTION FRACTIONOBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHYIN-HOSPITAL OUTCOMESBODY-MASS INDEXATRIAL-FIBRILLATIONCARDIOVASCULAR-DISEASEFOLLOW-UPAMERICAN-COLLEGEEUROPEAN-SOCIETYHEALTH-STATUS

## Health Status

**15-Overall survival with sacituzumab govitecan in hormone receptor-positive and human epidermal growth factor receptor 2-negative metastatic breast cancer (TROPiCS-02) a randomised, open-label, multicentre, phase 3 trial**

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**By Rugo, HS (Rugo, Hope S.) [1] , [18] ; Bardia, A (Bardia, Aditya) [2] ; Marme, F (Marme, Frederik) [3] ; Cortes, J (Cortes, Javier) [4] , [5] , [6] ; Schmid, P (Schmid, Peter) [7] ; Loirat, D (Loirat, Delphine) [8] ; Tredan, O (Tredan, Olivier) [9] , [10] ; Ciruelos, E (Ciruelos, Eva) [11] ; Dalenc, F (Dalenc, Florence) [12] ; Pardo, PG (Pardo, Patricia Gomez) [13] ;** **(provided by Clarivate) SourceLANCETVolume 402 Issue 10411 Page 1423-1433 DOI 10.1016/S0140-6736(23)01245-X Published OCT 21 2023 Early access OCT 2023 Indexed 2023-12-17 Document Type Article**

### Abstract

Background Sacituzumab govitecan demonstrated significant progression-free survival benefit over chemotherapy in the phase 3 TROPiCS-02 trial in patients with pretreated, endocrine-resistant hormone receptor-positive, human epidermal growth factor receptor 2-negative (HR+ and HER2-) metastatic breast cancer with limited treatment options. Here, we report the protocol-specified final analysis of overall survival and endpoints by trophoblast cell-surface antigen 2 (Trop-2) expression and other variables.Methods In this randomised, open-label, multicentre, phase 3 trial, which took place in 91 centres across North America (the USA and Canada) and Europe (Belgium, France, Germany, Italy, the Netherlands, Spain, and the UK), patients were randomly assigned (1:1) to receive sacituzumab govitecan or chemotherapy (eribulin, vinorelbine, capecitabine, or gemcitabine). Patients had confirmed HR+ and HER2- locally recurrent inoperable or metastatic breast cancer and had received at least one previous endocrine therapy, a taxane, and a CDK4/6 inhibitor in any setting and two to four previous chemotherapy regimens for metastatic disease. The primary endpoint was progression-free survival (previously reported and not included in this analysis), and secondary endpoints included overall survival, objective response rate (ORR), and patient-reported outcomes. Overall survival was assessed using stratified log-rank tests and Cox regression. Trop-2 expression was assessed in tumour tissue by immunohistochemistry. In the statistical testing hierarchy, ORR and patient-reported outcomes were tested sequentially if overall survival was significant. This study is registered with ClinicalTrials.gov, NCT03901339.Findings At the data cutoff date of July 1, 2022, 543 of 776 screened patients were randomly assigned between May 30, 2019, and April 5, 2021, with 272 patients in the sacituzumab govitecan group and 271 patients in the chemotherapy group. With a 12 center dot 5-month (IQR 6 center dot 4-18 center dot 8) median follow-up, 390 deaths occurred among 543 patients. Overall survival was significantly improved with sacituzumab govitecan versus chemotherapy (median 14 center dot 4 months [95% CI 13 center dot 0-15 center dot 7] vs 11 center dot 2 months [10 center dot 1-12 center dot 7]; hazard ratio [HR] 0 center dot 79, 95% CI 0 center dot 65-0 center dot 96; p=0 center dot 020); survival benefit was consistent across Trop-2 expression-level subgroups. ORR was significantly improved with sacituzumab govitecan compared with chemotherapy (57 [21%] patients vs 38 [14%]; odds ratio 1 center dot 63 [95% CI 1 center dot 03-2 center dot 56]; p=0 center dot 035), as was time to deterioration of global health status and quality of life (median 4 center dot 3 months vs 3 center dot 0 months; HR 0 center dot 75 [0 center dot 61-0 center dot 92]; p=0 center dot 0059) and fatigue (median 2 center dot 2 months vs 1 center dot 4 months; HR 0 center dot 73

[0 center dot 60-0 center dot 89]; p=0 center dot 0021). The safety profile of sacituzumab govitecan was consistent with previous studies (including the TROPiCS-02 primary analysis and the ASCENT trial). One fatal adverse event (septic shock caused by neutropenic colitis) was determined to be related to sacituzumab govitecan treatment.Interpretation Sacituzumab govitecan demonstrated statistically significant and clinically meaningful benefit over chemotherapy, with a 3 center dot 2-month median overall survival improvement and a manageable safety profile. These data support sacituzumab govitecan as a new treatment option for patients with pretreated, endocrine-resistant HR+ and HER2- metastatic breast cancer.

**Keywords**

**Keywords Plus**

POOLED ANALYSISERIBULINGUIDELINEWOMEN

## Health Status

### 16-Association of education level with mortality in United States - A cross-sectional study

**By Chang, WH (Chang, Weihong) [1] , [2] ; Zeng, QP (Zeng, Qingping) [1] , [2] ; Zhou, BD (Zhou, Boda) [2]**
**(provided by Clarivate) Source ACTA PSYCHOLOGICA Volume 253 DOI 10.1016/j.actpsy.2025.104774 Article Number 104774 Published MAR 2025 Early Access FEB 2025 Indexed 2025-02-16 Document Type Article**

**Abstract**

Educational level (EL), an important component for socioeconomic status, can potentially influence health, disease or mortality. Unfortunately, the detailed relationship between educational level and all cause or disease specific mortality in general population has not been elucidated, especially in Americans, which could impact public health policy. Here we analyzed association of EL with mortality in a nationally representative cohort from NHANES. This cohort study used National Health and Nutrition Examination Survey data from 1999 through 2018 and linked mortality information until 2019. Data were analyzed from April 1 through July 15, 2024. This study included 34,673 American adults aged 20-80 years old. During a median (IQR) follow-up of 9.9 (5.2-15.2) years, 5663 deaths were recorded. We found that higher EL was associated with mortality reduction in all cause, CVD, diabetes, Chronic Lower Respiratory Disease (CLRD), cancer and kidney disease mortality. Stratified analysis revealed that in subgroups <65 years, protection of higher EL was greater for all cause, CVD and cancer mortality. Higher EL was associated with reduction in male, while a risk factor in female for Alzheimer Disease, Influenza and Pneumonia Mortality. Higher EL was associated with mortality reduction in <65 subgroup, while a risk factor in >= 65 for Accidents Mortality. We found higher EL was associated with reduction in all cause, CVD, diabetes, Chronic Lower Respiratory Disease (CLRD), cancer and kidney disease mortality in a representative cohort in U.S. This study proved clear association between education level and disease specific mortality in a large nationally representative cohort in U.S., which may impact future public health policy making.

**Keywords**

**Author Keywords**

Public healthEducation levelSocial economic statusMortalityCVDCancer

## Health Status

# 17-Global, regional, and national burden of female cancers in women of child-bearing age, 1990-2021: analysis of data from the global burden of disease study 2021

**By Sun, P (Sun, Ping) [1] , [2] ; Yu, C (Yu, Chang) [3] ; Yin, LM (Yin, Limei) [1] , [2] ; Chen, Y (Chen, Yan) [1] , [2] , [4] ; Sun, ZC (Sun, Zhaochen) [1] , [2] , [4] ; Zhang, TT (Zhang, Tingting) [5] ; Shuai, P (Shuai, Ping) [1] , [2] ; Zeng, KH (Zeng, Kaihong) [1] , [2] ; Yao, XQ (Yao, Xiaoqin) [1] , [2] ; Chen, JY (Chen, Jianyu) [6] ;** **(provided by Clarivate) Source ECLINICALMEDICINE Volume 74 DOI 10.1016/j.eclinm.2024.102713 Article Number 102713 Published AUG 2024 Indexed 2024-07-16 Document Type Article**

**Abstract**

Background The global status of women ' s health is underestimated, particularly the burden on women of childbearing age (WCBA). We aim to investigate the pattern and trend of female cancers among WCBA from 1990 to 2021. Methods We retrieved data from the Global Burden of Disease Study (GBD) 2021 on the incidence and disabilityadjusted life -years (DALYs) of four major female cancers (breast, cervical, uterine, and ovarian cancer) among WCBA (15 - 49 years) in 204 countries and territories from 1990 to 2021. Estimated annual percentage changes (EAPC) in the age -standardised incidence and DALY rates of female cancers, by age and socio-demographic index (SDI), were calculated to quantify the temporal trends. Spearman correlation analysis was used to examine the correlation between age -standardised rates and SDI. Findings In 2021, an estimated 1,013,475 new cases of overall female cancers were reported globally, with a signi fi cant increase in age -standardised incidence rate (EAPC 0.16%), and a decrease in age -standardised DALY rate ( - 0.73%) from 1990 to 2021. Annual increase trends of age -standardised incidence rate were observed in all cancers, except for that in cervical cancer. Contrary, the age -standardised DALY rate decreased in all cancers. Breast and cervical cancers were prevalent among WCBA worldwide, followed by ovarian and uterine cancers, with regional disparities in the burden of four female cancers. In addition, the age -standardised incidence rates of breast, ovarian, and uterine cancers basically showed a consistent upward trend with increasing SDI, while both the agestandardised incidence and DALY rates in cervical cancer exhibited downward trends with SDI. Age -speci fi c rates of female cancers increased with age in 2021, with the most signi fi cant changes observed in younger age groups, except for uterine cancer. Interpretation The rising global incidence of female cancers, coupled with regional variations in DALYs, underscores the urgent need for innovative prevention and healthcare strategies to mitigate the burden among WCBA worldwide. Funding This study was supported by the Science Foundation for Young Scholars of Sichuan Provincial People ' s Hospital (NO. 2022QN44 and NO. 2022QN18); the Key R&D Projects of Sichuan Provincial Department of Science and Technology (NO. 2023YFS0196); the National Natural Science Foundation of China (No. 82303701). 

**Keywords**
**Author Keywords**

**Health Status**

Global burden of disease studyWomen of child-bearing ageBreast cancerCervical cancerOvarian cancerUterine cancer

**Keywords Plus**

BREAST-CANCERSOCIOECONOMIC-STATUSOVARIAN-CANCERHEALTH