



معهد دسمان للسكري  
Dasman Diabetes Institute



مؤسسة الكويت للتقدم العلمي  
Kuwait Foundation for the Advancement of Sciences

أحد مراكز  
Center



ANNUAL REPORT | 2022



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**H.H. Sheikh Nawaf Al-Ahmad  
Al-Jaber Al-Sabah**  
Amir of the State of Kuwait



**H.H. Sheikh Meshal Al-Ahmad  
Al-Jaber Al-Sabah**  
Crown Prince of the State of Kuwait



**H.H. Sheikh Ahmed Nawaf  
Al-Ahmad Al-Sabah**  
Prime Minister of the State of Kuwait

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# DG OPENING MESSAGE



**DR. QAIS SALEH ALDUWAI RI**

It is my privilege to share our latest research, medical, and operational accomplishments in the 2022 Dasman Diabetes Institute (DDI) Annual Report.

Established under the patronage of His Highness Sheikh Jaber Al-Ahmad Al-Sabah, the late Emir of the State of Kuwait, and the Kuwait Foundation for the Advancement of Sciences (KFAS), DDI strives to address the global impact of diabetes. We continuously adapt our research, medical, and educational initiatives to fit the needs of the community.

In efforts to reduce the incidence and impact of diabetes in Kuwait, our Research Sector has focused on translating scientific discoveries and applying them to clinical practice. DDI's translational research initiatives aim to benefit society and improve health outcomes using effective prevention strategies. In 2022, DDI published **93 research publications**, of which **51 are original research publications** in 2022.

At DDI, we use the latest standards of care for the treatment of diabetes and our preventative efforts utilize cutting-edge research, innovative screening modalities, and pharmacological advancements. Our Patent & Research Translation Office ensures the development and protection of the Institute's patent rights. In 2022, **four patents were approved** and granted to DDI, while **four patents remain ongoing**.

## DG OPENING MESSAGE

Our Medical Sector's clinical improvements represent our patients' willingness to live a healthier lifestyle. In the Diabetes Remission Program, **50% of patients reduced their medications by 50%**. The Dose Adjustment for Normal Eating (DAFNE) Program continues in 2022, with **802 graduates**. The Clinical Skills Center also held 372 courses for medical professionals and the public.

DDI has also developed educational programs aimed to train healthcare professionals, patients, and caregivers. Our educational initiatives are now being offered online for healthcare professionals to complete at their own convenience. In collaboration with the World Health Organization, we continue to offer the Prevention and Management of Diabetic Foot Complications training course.

DDI has also concluded several collaborations with prestigious international centers, institutions, and universities. These collaborative initiatives help provide an alternative approach to diabetes treatment, transfer knowledge to both research and clinical settings, and ultimately improve the quality of life with diabetes.

In 2022, DDI received the International Diabetes Federation 'Centre of Excellence' certification for its holistic approach to diabetes care and multidisciplinary educational programs. Our Clinical Skills Center was also certified by the Royal College of Surgeons to deliver the Basic Surgical Skills course to healthcare professionals.

In conclusion and on behalf of the employees at the Dasman Diabetes Institute, I can only express my heartfelt appreciation and gratitude to His Highness Sheikh Nawaf Al-Ahmad Al-Jaber Al-Sabah, the Emir of the State of Kuwait, and to His Highness Sheikh Meshal Al-Ahmad Al-Jaber Al-Sabah, the Crown Prince, and to His Highness Sheikh Ahmed Nawaf Al-Ahmad Al-Sabah, the Prime Minister - may God protect them and grant them success in moving our beloved country forward on the path of progress and prosperity.

In the following pages, it is my pleasure to share a synopsis of our 2022 Achievements.

**Dr. Qais Saleh Alduwairi**  
Director General  
Dasman Diabetes Institute

# KEY ACHIEVEMENTS

## KEY ACHIEVEMENTS

### Prize Awards

#### International Diabetes Federation (IDF) Center of Excellence



In May 2022, DDI attained the IDF Centre of Excellence for its efforts in education and training of medical professionals and people with diabetes. DDI's recognition as being part of a collaborative network, both internationally and regionally, enhances its ability to initiate, coordinate, facilitate, and conduct diabetes education programs.

#### Basic Surgical Skills Certification



DDI was certified by the Royal College of Surgeons of England to deliver **Basic Surgical Skills (BSS)** between October 2022-June 2025. This course introduces surgical trainees to safe surgical practice within a controlled workshop environment and aims to "teach, assess and certify" the ability of trainees to use safe and sound surgical techniques that are common to all forms of surgery.



This is to certify that  
**Dasman Diabetes Institute**  
is approved to deliver

**Basic Surgical Skills (BSS)**

on behalf of

**The Royal College of Surgeons of England**

between  
October 2022 - June 2025

**Professor Neil Mortensen**  
President, The Royal College of Surgeons of  
England  
Registered Charity No. 212808



### 2022 DDI Publications



**23**

Reviews, Editorials, etc.



**19**

Collaborative Publications



**51**

Original Research Publications



**93**

Total Number of Publications

### 2022 DDI Collaborations



**1**

New Collaboration



**12**

Reviewed Collaborations



**1**

New Consortium



**3**

Regional Research Collaborations



**35**

National Collaborative Projects



**9**

Ongoing Collaborative Consortia

### 2022 Ongoing Research Projects



**38**

Research Sector Projects



**14**

Medical Sector Projects



**2**

Operations Sector Projects



**1**

DG Directorate Project

### 2022 DDI Activities



**63**

Activities



**54**

Awareness Information



**54**

Press Releases



**92**

Health Awareness Videos & TV/Radio Interviews



**519**

Public Awareness Posts

### 2022 Clinical Improvements



**60%**

T1DM patients achieving HbA1c levels of < 8 mmol/l



**>4,000**

Patients seen for one-to-one diabetes education



**4,030**

Investigations provided in the DIC



**3,933**

Patients were seen across DDI clinics



**372**

Clinical Skills Courses held with 1,654 students



**254**

HCPs\* trained on retinal screening, foot screening, and diabetes education

\* HCPs: Healthcare professionals

# STRATEGY MANAGEMENT OFFICE



## Introduction

A well-defined Vision, Mission Statement, Values, and Objectives can help drive the strategic framework, focus efforts, facilitate stakeholder communication, guide strategic planning, enable accountability, and shape the organizational culture within DDI. They serve as essential pillars for the Institute's success in addressing the challenges posed by diabetes.



## Vision

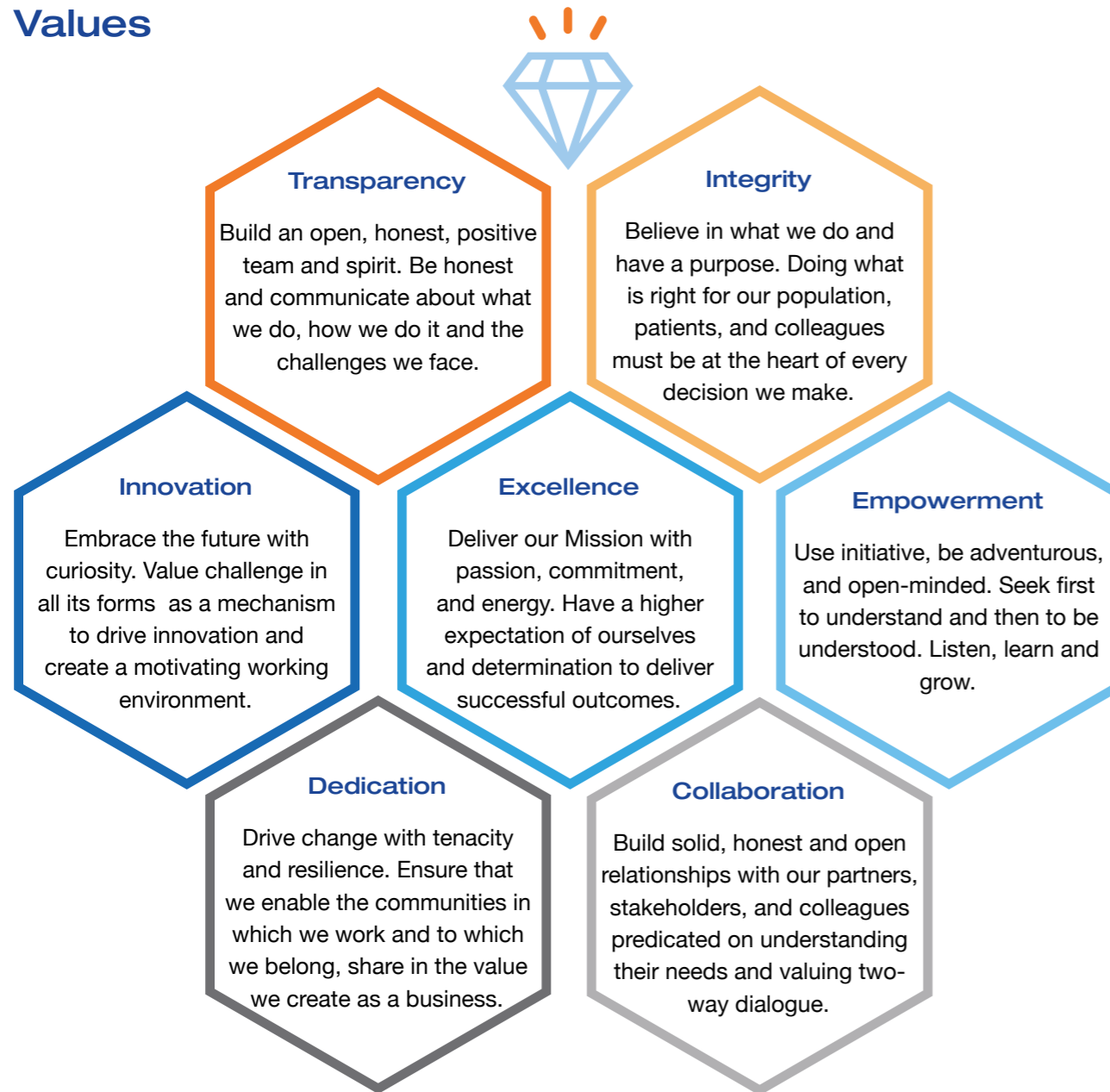
To be the leading diabetes institute in the MENA region and to be recognized internationally.



## Mission

To address the diabetes epidemic in Kuwait through focused diabetes research, integrated prevention, training, education, and treatment.

## Values



## Objectives

- Undertake integrated research initiatives using biomedical, population health, and clinical expertise to address diabetes research areas that tackle the epidemic in Kuwait.
- Initiate, measure, and evaluate the impact of research for the prevention and management of diabetes.
- Develop new research strategies, raise awareness, and share diabetes-related knowledge and content through education.
- Continuously maximize the use of our resources and assets to ensure financial/organizational sustainability.

## DDI Strategic Initiatives

The DDI strategic plan encompasses five strategic initiatives spread across the Institute. Several programs support initiatives and adopt a targeted approach in achieving DDI's Vision, Mission, and main Objectives.

DDI is actively executing its strategic plan by embracing transformational change and effective leadership principles. Moreover, the Institute is effectively translating research outcomes from laboratory discoveries to practical applications, and then extending these benefits from individualized care to the wider community. This approach enables DDI to fulfill its Mission and realize its Vision successfully.

### Initiative 1 - Research

Epidemiology, Etiology, Genetics and Pathophysiology of Diabetes and its Complications		
Research Strategic Directions # 1	Research Strategic Directions # 2	Research Strategic Directions # 3
Genetics/omics Related to Diabetes & Metabolic Diseases	Epidemiology and Public Health Aspects of Diabetes and its Complications	Pathophysiology of Diabetes and its Complications
<b>Objectives:</b>	<b>Objectives:</b>	<b>Objectives:</b>
<ul style="list-style-type: none"> <li>Develop the database of genome-wide variations in Kuwaiti families with focus on type 1 diabetes mellitus (T1DM), type 2 diabetes mellitus (T2DM), maturity-onset diabetes of the young (MODY), gestational diabetes mellitus (GDM), neonatal diabetes, and rare metabolic diseases.</li> </ul>	<ul style="list-style-type: none"> <li>Support the Ministry of Health (MoH) in epidemiological and quality of care studies related to metabolic diseases, risk factors, and complications.</li> </ul>	<ul style="list-style-type: none"> <li>Discover and assess diagnostic and prognostic biomarkers for diabetes and its complications.</li> <li>Understand specific signaling pathways involved in diabetes and its complications.</li> </ul>
<b>Research Sector</b>		

## Initiative 2 - Research & Clinical Research

Prevention and Management of Diabetes and its Complications	
Research Strategic Directions # 4	
Clinical Care Research / Clinical Trials	
<b>Objectives:</b>	
<ul style="list-style-type: none"> <li>• Implement clinical trials for the prevention and treatment of diabetes, related disorders and its complications tailored to Kuwaiti population.</li> <li>• Increase understanding of the mechanisms by which interventions can contribute to the prevention and management of diabetes, using mechanistic and imaging techniques.</li> </ul>	
Research Sector	Medical Sector

## Initiative 3 - Clinical & Medical

Education and Training Development
Development of Educational training and delivery of awareness-raising programs for patients, caregivers, and the general public.
<b>Objectives:</b>
<ul style="list-style-type: none"> <li>• Design and implement education programs and projects:                             <ul style="list-style-type: none"> <li>» for patients and their caregivers in the context of T1DM and T2DM prevention and management (e.g., DAFNE, KICKOFF and remission).</li> <li>» based on innovative technology for treatment and management of diabetes and obesity.</li> <li>» accredited training and education programs for professionals initially in Kuwait, followed by an expansion in the Gulf Cooperation Council (GCC) region.</li> <li>» to train staff in Clinical Research Best Practices.</li> </ul> </li> <li>• Design and develop mind/body behavioral change programs to decrease the burden of diabetes and improve overall well-being and higher function.</li> <li>• Continue the implementation and enhancement of programs for schools and public awareness.</li> <li>• Test diabetes educational impact on clinical outcomes.</li> <li>• Collaborate with MoH on diabetes quality improvement initiatives across Kuwait that enhance awareness, prevention, and management of diabetes.</li> </ul>
Medical Sector

## Initiative 4 - All DDI

Organisational Transformation
Organizational transformation ensures the long-term survival and success of an organization via governance and management frameworks to enable optimal outcomes.
<b>Objectives:</b>
<ul style="list-style-type: none"> <li>• Design and implement:                             <ul style="list-style-type: none"> <li>» an integrated governance structure to ensure clarity in roles, responsibilities, and accountabilities.</li> <li>» a 'High-Performing Team' program to support cultural change across the organization and provide momentum for organizational growth.</li> <li>» a comprehensive Health Informatics, Knowledge Management and Electronic Health Record programs.</li> </ul> </li> <li>• Establish a Strategic Management Office responsible for overseeing the design, implementation, and monitoring of all strategic programs across the Institute.</li> <li>• Implement a Performance Management Framework which is aligned to the 2018-2023 Strategy.</li> <li>• Review all partnerships and collaborations to understand how they support the strategy and where gaps may exist to support our strategic ambition.</li> </ul>
DG Directorate    Research Sector    Medical Sector    Operation Sector

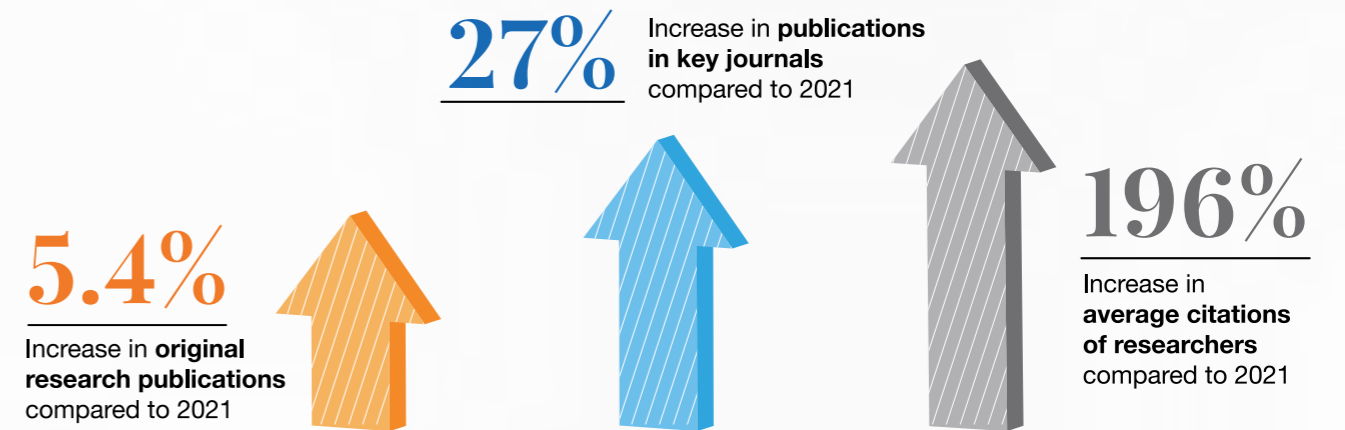
## Initiative 5 - All DDI

Organisational Sustainability
The primary goal is to create long-term value and continued success.
Sustainability is closely linked to financial stability and resilience, with a focus on revenue generation.
DG Directorate    Research Sector    Medical Sector    Operation Sector

# RESEARCH SECTOR

RESEARCH SECTOR

## MAIN ACHIEVEMENTS OF 2022



Establishment of a New Department  
**Bioenergetics & Neurometabolism**

**1**

New Collaboration  
**University of Oxford**

### 2022 Research Publications



**9**

Reviews,  
Editorials, etc.



**14**

Collaborative  
Publications



**42**

Original Research  
Publications

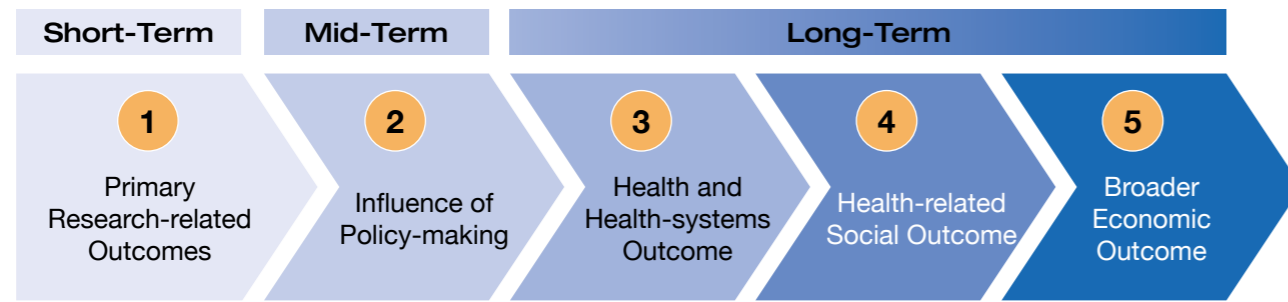


**65**

Total Number of  
Publications

## RESEARCH-RELATED OUTCOMES

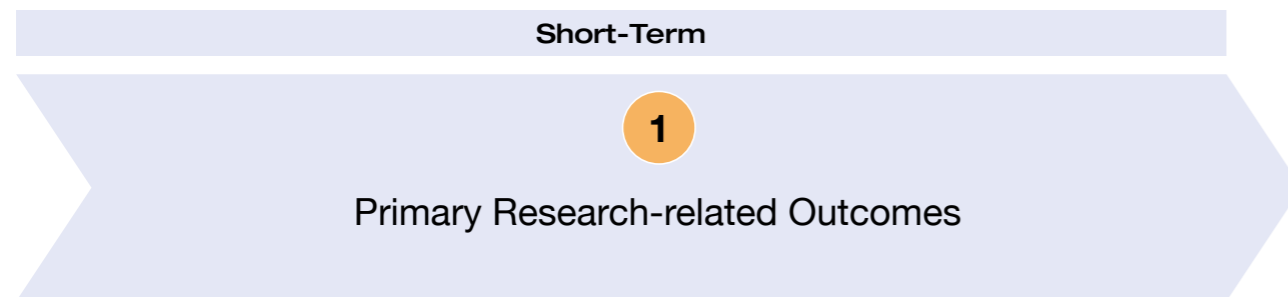
Figure 1. Our research-related outcomes, ranging from short- to long-term.



Below is an outline of the main research-related outcomes achieved by the Research Sector in 2022.

## PUBLICATIONS

Research Publications are one of the most important outputs as they allow and propel novel ideas and discoveries. Publishing an article in a reputable journal increases the visibility and credibility of researchers and an Institute.



### Quantity

One of our primary outcomes is publishing research in esteemed journals (Figure 1). In 2022, as per the recommendations of the International Scientific Advisory Board (ISAB), researchers in DDI’s Research Sector focused on producing more original research-based publications.

Figure 2. The number and type of publications for the year 2021 and 2022 of the Research Sector, along with comparison of percentages of each category between the two years.



\* Reviews include Reviews, Editorials, Comments, Letters to the Editor, and Short Communications.  
 \*\* Others refer to collaborative papers and publications where DDI staff are co-authors, but none of the actual research was done within DDI (excluding data sharing).

### Quality

DDI prioritizes the quality of research publications and therefore relies on two quality metrics, a journal’s impact factor and quartile ranking.

### Impact Factor

The impact factor (IF) of a journal is used to evaluate the importance of the journal within its field and to measure the frequency with which an article in a journal has been cited within a particular period. The higher the IF of a journal, the more highly ranked the journal is.

In 2022, there was a **32% increase** in the **median IF**, as compared to 2021 (Median IF = 6.055 vs 4.599, respectively). As for manuscripts published in key journals, i.e., journals with an **IF ≥ 5**; in 2022, 68% of the total articles were published in key journals, as compared to 41% of those in 2021. There was a 28% increase in publications in key journals from 2021 to 2022 (Table 1).

In 2022, the Research Sector produced manuscripts that were published in esteemed journals, such as **Nature Medicine** (IF, 87.21), **Nature** (IF, 69.5), and **Science Translational Medicine** (IF, 19.31; Table 2).

**Table 1.** Comparison of median impact factor (IF) and publications in key journals, i.e., journals with an IF of  $\geq 5$ , between 2021 and 2022.

	2021	2022	Increase from 2021 to 2022
Median IF	4.599	6.055	32%
Key journals (IF $\geq 5$ )	40%	68%	28%

Abbreviations: IF, impact factor.

**Table 2.** List of key journals (IF > 5) publications from the Research Sector in 2022.

S. No	Name of Journal	Impact Factor	No. of Papers
1	Nature Medicine	87.241*	1
2	Nature	69.504*	1
3	Science Translational Medicine	19.319*	1
4	Genome Biology	17.906*	1
5	Nature Communications	17.694*	1
6	Diabetes Care	17.152*	1
7	EBioMedicine	11.205	1
8	American Journal of Human Genetics	11.043	1
9	Obesity	9.298	1
10	Frontiers in Immunology	8.786	1
11	Molecular Metabolism	8.568	2
12	Diabetes/Metabolism Research and Reviews	8.128	1
13	International Journal of Biological Macromolecules	8.025	5
14	Cells	7.666	1
15	Life Sciences	6.780	1
16	Nutrients	6.706	2
17	Computers in Biology and Medicine	6.698	1
18	Pharmaceutics	6.525	1
19	Frontiers in Public Health	6.461	2
20	International Journal of Molecular Sciences	6.208	7

S. No	Name of Journal	Impact Factor	No. of Papers
21	Frontiers in Endocrinology	6.055	1
22	Frontiers in Pharmacology	5.988	1
23	Human Genetics	5.881	1
24	Clinical Kidney Journal	5.86	1
25	Journal of Immunology	5.426	2
26	Journal of Biomolecular Structure & Dynamics	5.235	2
27	Journal of Ethnopharmacology	5.195	1
28	Frontiers in Medicine	5.058	2

\* Top journals with the highest impact factor in their respective fields.

### Quartile Ranking

DDI is continuously looking to improve its research quality output and aims to publish in journals with a high quartile ranking. DDI uses the key performance indicator “% indexed publications in Quartile 1 and 2 journals,” which is commonly used in Kuwait.

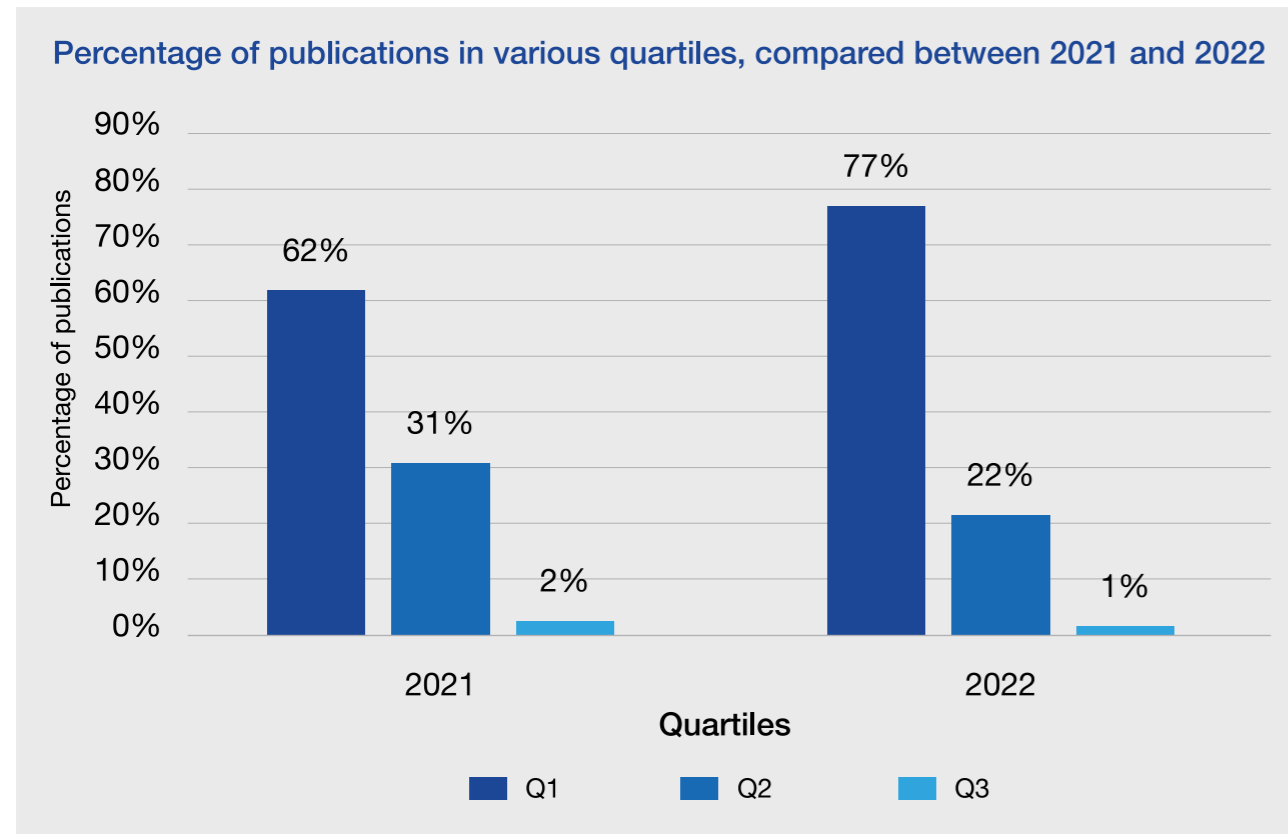
In addition to the IF, rankings of journals in each subject category are divided into quartiles, which rank the journals from highest to lowest based on their IF. There are four quartiles: Q1, Q2, Q3 and Q4, which are explained in Table 3 below.

**Table 3.** Definition of quartile ranking of DDI publications

Quartile	Definition
Quartile 1 (Q1)	Denotes the top 25% of the IF distribution
Quartile 2 (Q2)	Denotes middle-high position distribution (top 50% to top 25%)
Quartile 3 (Q3)	Denotes middle-low position distribution (top 75% to top 50%)
Quartile 4 (Q4)	Denotes lowest position (bottom 25% of the IF distribution)
N/A	No available score for the journal, not listed

In 2022, a higher percentage of publications of the Research Sector were published in Q1 journals; the breakdown of publications in each quartile, compared between 2021 and 2022, is shown in Figure 2.

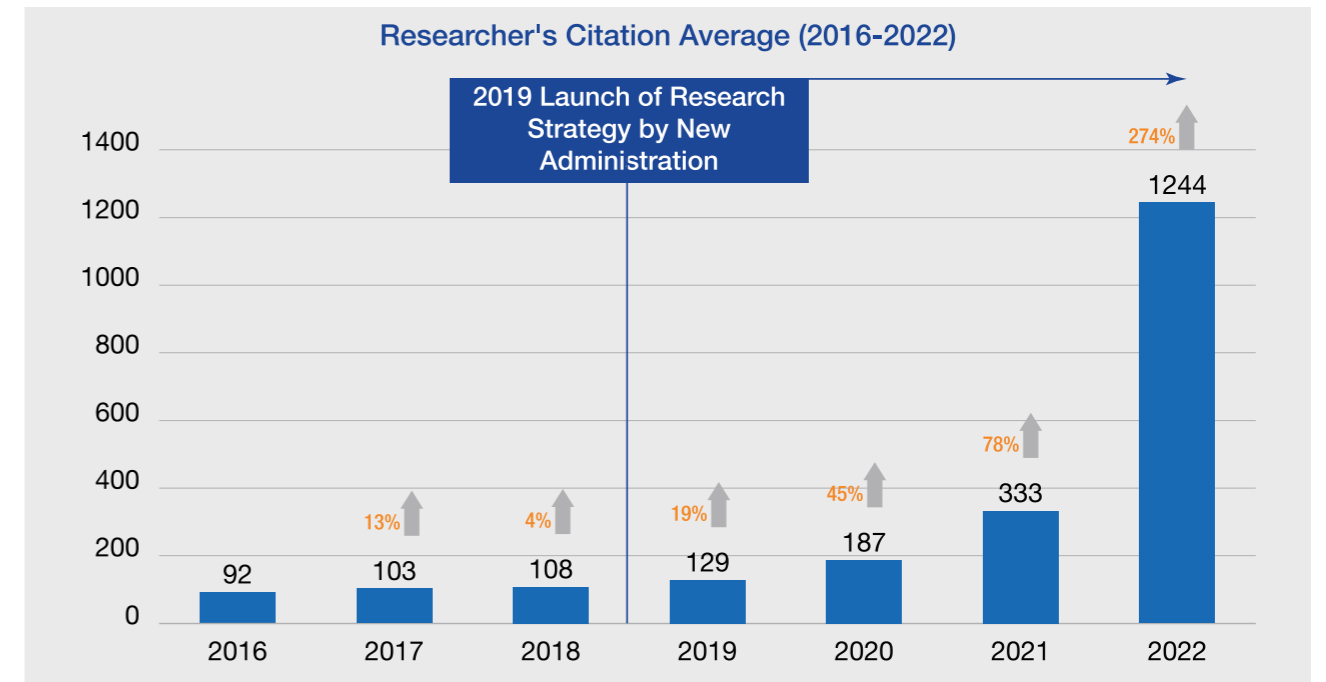
**Figure 3.** Comparison of publications falling into different quartile scores between 2021 versus 2022.



### Citations

The average citations of the researchers were 1244 in 2022, showing a staggering increase of 274% from 2021.

**Figure 4.** Comparison of the average citation of researchers from 2016 to 2022.

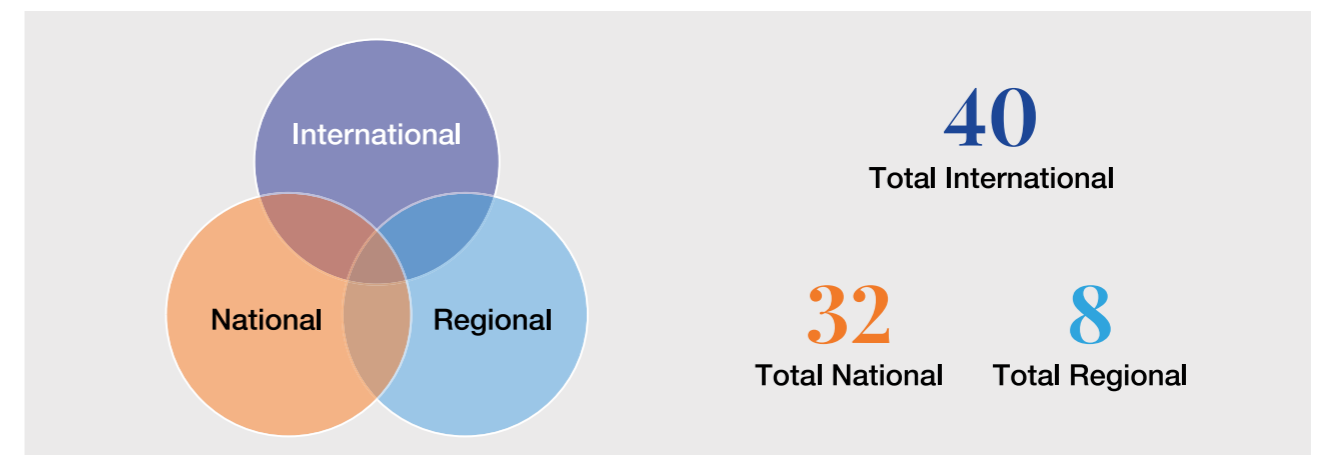


Blue line indicates new strategy launched by management in 2019.

### Collaborative Publications

In 2022, the number of articles published with international, national, and regional collaborators are shown in **Figure 5**.

**Figure 5.** Venn diagram showing the number of articles published with International, National, and Regional collaborators.



## NOTABLE PUBLICATIONS OF 2022

### Immunology & Microbiology

<b>Title</b>	<b>Hepatic Interferon Regulatory Factor 3 (IRF3) fuels dysglycemia in obesity through direct regulation of Ppp2r1b.</b>
<b>Journal Name</b>	Science Translational Medicine
<b>Journal Impact Factor</b>	19
<b>Collaborations</b>	International
<b>What can be concluded?</b>	<ol style="list-style-type: none"> <li>1. The study found that IRF3 is directly induced by obesity, and that it promotes glucose production by upregulating the expression of another protein called Ppp2r1b.</li> <li>2. The researchers show that obesity may lead to increased levels of IRF3 in the liver. This, in turn, can lead to increased glucose production and insulin resistance.</li> <li>3. Thus, suppressing IRF3 expression can help to improve glucose homeostasis in obese mice, suggesting a potential therapeutic role.</li> </ol>
<b>What is the potential impact?</b>	The results of this study could be applied in clinical practice. For instance, blocking the activity of IRF3 and/or Ppp2r1b could be a potential treatment for dysglycemia in obese individuals.

### Bioenergetics & Metabolism

<b>Title</b>	<b>Early macrophage response to obesity encompasses Interferon Regulatory Factor 5 (IRF5) regulated mitochondrial architecture remodeling</b>
<b>Journal Name</b>	Nature Communications
<b>Journal Impact Factor</b>	17.69
<b>Collaborations</b>	International
<b>What can be concluded?</b>	<ol style="list-style-type: none"> <li>1. The findings of this study suggest that IRF5, an inflammatory transcription factor, controls how macrophages adapt to diet-induced obesity by regulating the architecture of their mitochondria.</li> <li>2. The researchers found that IRF5 represses the expression of a gene called Growth Hormone Inducible Transmembrane Protein (Ghitm), which is involved in maintaining the architecture of mitochondria. This leads to alterations that lead to increased oxidative respiration.</li> <li>3. Increased oxidative respiration is a hallmark of obesity, and it can contribute to the development of T2DM.</li> </ol>
<b>What is the potential impact?</b>	The study's findings suggest that IRF5 may play a role in the early stages of obesity-induced inflammation, and that drugs targeting IRF5 may be a potential strategy for the prevention or treatment of obesity and T2DM.



## Population Health

<b>Title</b>	<b>Once-Weekly Exenatide in Youth with T2DM</b>
<b>Journal Name</b>	Diabetes Care
<b>Journal Impact Factor</b>	17.152
<b>Collaborations</b>	National, International
<b>What can be concluded?</b>	<ol style="list-style-type: none"> <li>1. Researchers found that once-weekly exenatide was effective in reducing glycated hemoglobin (HbA1c) levels in youth with T2DM who were sub-optimally controlled with current treatments.</li> <li>2. Once-weekly exenatide was well tolerated in youth with T2DM. With exenatide, more youth with T2DM will have access to a treatment that can help them manage their condition and improve health outcomes.</li> <li>3. Exenatide has several benefits, such as once-weekly dosage, superior glycemic control, safety and tolerability.</li> </ol>
<b>What is the potential impact?</b>	Exenatide could be prescribed as a new therapy for children and adolescents with T2DM who are not achieving desired results with their previous treatment regimen.



## Biochemistry and Molecular Biology

<b>Title</b>	<b>Development of a clinical risk score to predict death in patients with COVID-19</b>
<b>Journal Name</b>	Diabetes/Metabolism Research and Reviews
<b>Journal Impact Factor</b>	8.123
<b>Collaborations</b>	National, International
<b>What can be concluded?</b>	<ol style="list-style-type: none"> <li>1. Researchers developed a clinical risk score that was able to correctly predict deaths in 75% of patients with COVID-19 in a Kuwaiti population, and was validated in an Italian patient population.</li> <li>2. Using this clinical risk score, researchers were able to predict which patients with COVID-19 were more likely to die due to the disease.</li> </ol>
<b>What is the potential impact?</b>	<ol style="list-style-type: none"> <li>1. This tool can be used to improve the care of patients who are at a high risk of death and provide them with more intensive care. This would help to reduce the number of deaths.</li> <li>2. The approach used in this study could be used to develop a clinical risk score for other diseases, such as perhaps diabetes, in the Kuwaiti population.</li> </ol>



## Genetics & Bioinformatics

<b>Title</b>	<b>Caveolin-1 (CAV1) rs1997623 variant and adult metabolic syndrome—Assessing the association in three ethnic cohorts of Arabs, South Asians, and Southeast Asians</b>
<b>Journal Name</b>	Frontiers in Genetics
<b>Journal Impact Factor</b>	4.772
<b>Collaborations</b>	None
<b>What can be concluded?</b>	<ol style="list-style-type: none"> <li>1. The CAV1 rs1997623 variant is associated with the development of metabolic syndrome (MetS) in Kuwaiti adults.</li> <li>2. The study suggests that this variant may be a potential target for drug development and could help in identifying new targets for the diagnosis, prevention, and treatment of MetS.</li> <li>3. The study suggests that this variant may affect the way that the body handles fats in Kuwaiti adults with MetS.</li> </ol>
<b>What is the potential impact?</b>	<ol style="list-style-type: none"> <li>1. This could help in raising awareness of the risk factors for metabolic syndrome in the Kuwaiti population. This could lead to people being more proactive about managing their risk factors, such as maintaining a healthy weight and eating a healthy diet.</li> <li>2. Since translational research has become a core focus at DDI, such studies could be used to develop new screening strategies for MetS in the Kuwaiti population, providing high benefits to the community.</li> </ol>



## CONFERENCES

The Research teams of DDI presented their research at 34 conferences: 29 international conferences, 1 regional, and 4 national events. Researchers achieved unprecedented success in 2022 when 11 abstracts were accepted at the 82nd Scientific Sessions of the American Diabetes Association (ADA) at New Orleans, LA, USA. DDI researchers had the opportunity to present research from various areas currently conducted at DDI (Table 4).

**Table 4.** List of poster and oral presentations at the 82nd Scientific Sessions of the American Diabetes Association conducted on June 3–7 2022 in New Orleans, LA, USA.

All authors	Presenting Author	Department	Title	Type (Poster/Oral)
Mohammed Dashti, Rasheeba Nizam, Prashantha Hebbar, Sindhu Jacob, Sumi Elsa John, Arshad Channanath, Hessa Al-Kandari, Thangavel Alphonse Thanaraj, Fahd Al-Mulla	Mohammed Dashti	Genetics and Bioinformatics	ICA1 Is differentially methylated and expressed in familial T1DM	Poster
Anwar Mohammad, Mohamed Abu-Farha, Dhanya Madhu, Preethi Cherian, Irina AlKhairi, Prashantha Hebbar, Sina Kavalakatt, Hossien Arefanian, Nada Alamaldin, Thangavel Alphonse Thanaraj, Fahd Al-Mulla, Jehad Abubaker	Anwar Mohammad	Biochemistry and Molecular Biology	ANGPTL8 Variant R59W is Associated with Increased Circulatory TNF- and IL7 LEVELS and Inflammation	Poster
Taibah Alqaisi, Ahmad Alsabr, Hessa Alkandari, Dalia Alabdulrazza	Taibah Alqaisi	Population Health	Glycemic Control Two Years after Diagnosis in Children with T1DM In Kuwait	Poster

All authors	Presenting Author	Department	Title	Type (Poster/Oral)
Fouzeyah Othman, Dalia Al-Abdulrazzaq, Hessa Al-Kandari	Fouzeyah Othman	Population Health	Effect of the Second Wave on Diabetes Ketoacidosis and ICU Admission Rates in Newly Diagnosed Children with T1D in Kuwait	Poster
Alphonse Thanaraj Thangavel, Mohamed Abu-Farha, Prashantha Hebbar, Mohammad Qaddoumi, Fahd Al-Mulla, Jihad Abubaker	Alphonse Thanaraj Thangavel	Genetics and Bioinformatics	GALNT2 Variant Associates with Increased ANGPTL3 Circulation Level and Obesity.	Poster
Neha Munawar, Ashraf Al Madhoun, Joelle Nader, Waleed Al-Ali, Willias Masocha, Fahd Al-Mulla, Milad S. Bitar,	Ashraf Al Madhoun	Genetics and Bioinformatics	Guanfacine normalizes presynaptic alpha-2 adrenoceptors enrichment and ameliorates neuropathic pain in T1DM.	Poster
Ashraf Al Madhoun, Dania Haddad, Shihab Kochumon, Rasheeba Nizam, Reeby Thomas, Lavina Miranda, Sindhu Jacob, Sardar Sindhu, Rasheed Ahmad, Fahd Al-Mulla	Ashraf Al Madhoun	Genetics and Bioinformatics	The Tale of Caveolin 1 rs1997623 Variant in Obesity and Metabolic Syndrome.	Poster
Ashraf Al Madhoun, Prashantha Hebbar, Rasheeba Nizam, Dania Haddad, Mohammed Dashti, Mohamed Abu-Farha, Motasem Melhem, Rasheed Ahmad, Thangavel Alphonse Thanaraj, Fahd Al-Mulla	Ashraf Al Madhoun	Genetics and Bioinformatics	Caveolin 1 rs1997623 is associated with metabolic syndrome in Arab adult individuals from Kuwait.	Poster

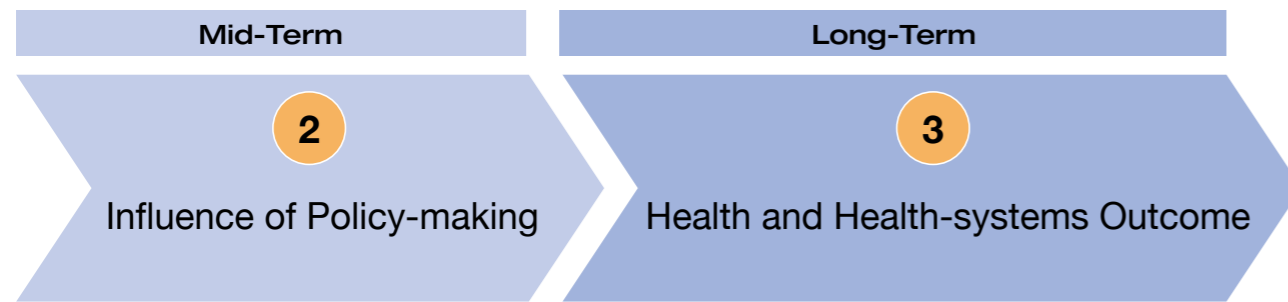
All authors	Presenting Author	Department	Title	Type (Poster/Oral)
Mohamed Abu-Farha, Mariam Alatrach, Jihad Abubaker, Irina Al-Khairi, Preethi Cherian, Krisitn Agyin, Siham Abdelgani, Ebaa Alozairi, John Adams, Ralph DeFronzo, Fahd Al-Mulla, Muhammad Abdul-Ghani	Mohamed Abu-Farha	Biochemistry and Molecular Biology	Plasma Insulin is Required for the Increase in Plasma ANGPTL8 in Response to Nutrient Ingestion.	Oral
Rasheed Ahmad, Shihab Kochumon, Amal Hasan, Sardar Sindhu, Hossein Arefanian, Fatema Al-Rashed, Fahd Al-Mulla	Rasheed Ahmad	Immunology and Microbiology	Increased Adipose Tissue Expression of IL-23 and Its Association with Inflammation in Individuals with High LDL Cholesterol	Poster
Fatema Al-Rashed, Fatemah Alzaqqah, Ashraf Al Madhoun, Rawan Alqabandi, Sardar Sindhu, Fahd Al-Mulla, Rasheed Ahmad	Fatema Al-Rashed	Immunology and Microbiology	IL-6R (trans-signaling) is a major modulator of reverse cholesterol transport in lipid-laden macrophages	Oral

## COLLABORATIONS & CONSORTIA

### Collaborations

Institutional and researcher-to-researcher collaborations serve **short- to long-term benefits**. They enable the exchange of research expertise (data and information), increase productivity and efficiency, expand areas of research, and enhance the quality of research. In 2022, the Research Sector at DDI continued to expand its research with national, regional, and international collaborations (Table 5). In 2022, **1 new collaboration** was established with **Oxford University** (see Highlight Box 1 below for more).

RESEARCH -RELATED OUTCOMES



**Table 5.** Ongoing and new national, regional, and international collaborations of the Research Sector at DDI in 2022.

Collaborations	Country
<b>National</b>	
Kuwait University	Kuwait
Ministry of Health	Kuwait
<b>Regional</b>	
Weill Cornell University	Qatar
Hamad Medical Corporation	Qatar
King Abdullah University of Science and Technology	Saudi Arabia
<b>International</b>	
Montreal Diabetes Research Center	Canada
McGill University	Canada
Kings College, London	UK
University of Texas Health Science Center	USA
University of Canberra	Australia
University College, London	UK
BIDMC-Harvard	USA
Yale University	USA
The Rockefeller University Hospital	USA
University of Oxford*	UK

\* New collaboration

New collaboration with the University of Oxford

**Professor John Todd, Professor of Precision Medicine, University of Oxford**

The Research Sector extends its collaborative efforts, this time with a world-renowned expert in the genetics of T1DM, Professor John Todd.

*“Prof. Todd’s insights and expertise will be invaluable to the research at DDI, and we are confident that his collaboration will lead to fruitful outcomes for our Institute and the population.”*  
 Added Prof. Al-Mulla, CSO, Research Sector.

Prof. Todd’s work has helped revolutionize our understanding of genetics and T1DM, by pioneering genome-wide genetic studies on the association between disease-associated genetic variants and phenotypes in T1DM. His insights will be essential to the research efforts currently carried out by the Research Sector and this collaboration will enable the development of novel approaches towards the prevention and treatment of T1DM.

New collaboration: University of Oxford	
<b>Title:</b>	<b>Elucidating the Landscape of Genetic / Epigenetic Factors Involved in the Initiation and Prevention of Autoimmunity and T1DM Among the Kuwaiti Population</b>
<b>Principal Investigator:</b>	Dr. Amal Hasan
<b>Significance:</b>	The results will: <ul style="list-style-type: none"> <li>• Enable us to identify gene variants, epigenetic changes, and related immune responses that might be specific to the Kuwaiti population.</li> <li>• Help design effective strategies to identify risk and prevent autoimmunity/T1DM in individuals with high-genetic risk, or halt disease progression in newly diagnosed patients.</li> <li>• Enable early identification of those at risk of progression to T1DM via the screening/measurement of autoantibodies in a large number of Kuwaiti children.</li> <li>• Help in implementing preventative strategies.</li> <li>• Phase II will compose of a case control study to calculate the overall genetic risk score within the Kuwaiti population.</li> </ul>

**Outcomes & Impact:** This study is expected to have a strong clinical and scientific impact. Data from this study is expected to lead to publications in international journals and presentations at conferences.

### Consortia

Consortia are excellent platforms to address challenging scientific questions and provide researchers with the ability to exchange and/or pool resources and expertise to solve complex issues. Researchers at DDI are highly involved and engaged in such multiorganizational consortia and use these as platforms to network, contribute, and add value to the international scientific community. As of 2022, DDI researchers have been participating in 8 ongoing consortia (Table 6).

Table 6. List of ongoing consortia in which DDI Researchers have been actively participating.

S. No.	Consortium
1	International SWEET Network
2	Genetic Investigation of Anthropometric Traits (GIANT)
3	Global Lipids Genetics (GLGC) at Broad Institute (USA)
4	Weill-Cornell Medicine (Qatar and New York) on genome data sharing & integration
5	NCD Risk Factor Collaboration (NCD-RisC)
6	COVID Human Genetic Effort - MISC (Rockefeller)
7	Personalised Medicine Coalition
8	COVIDiab Registry

### Scientific Knowledge Transfer

Knowledge transfer not only enables the sharing of thought processes, cognitive structures, broader contextual methods, but also provides a platform for scientific exchange and mentorship. The Research Sector at DDI continues to enhance its education, teaching, and networking year by year. In 2022, the Research Sector organized 38 internal lectures, that included 21 Journal Clubs and 17 Research Presentations, along with 7 Guest Lectures (Table 7). Key research is also highlighted in a quarterly-published Research Newsletter, through which the achievements of researchers and upcoming events are disseminated among the Sector.

Table 7. Number of lectures and presentations facilitated by the Research Sector in 2022.

Internal Lectures	38
Journal Clubs	21
Research Presentations	17
Guest lectures	7
<b>Total</b>	<b>83</b>



## Innovations & Patents

Patents protect the rights of DDI’s research, ensure research development and transfer to industry, organize multinational collaborative relationships, and may provide a platform for return on investment in research. As of 2022, 4 patents have been approved and granted to DDI, while 4 patents are still ongoing. The patents approved in 2020 and 2021 are tabulated below (Table 8).

Table 8. DDI patents approved till date.

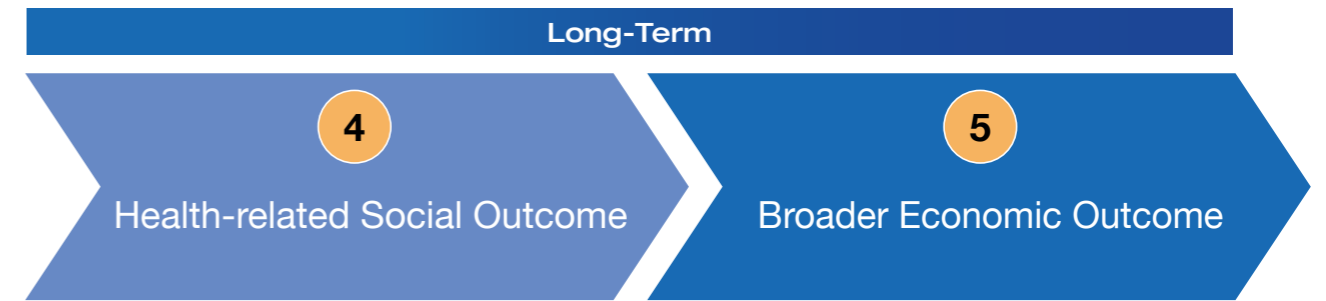
Docket No.	Year Granted	Title of Invention(s)	Inventors	Co-Inventor(s)
33024.00	2020	Method for preventing progression to metabolic syndrome	Prof. Fahd Al Mulla	Raseeba Nizam, Dr. Ashraf Madhoun
33024.01	2020	Use of MicroRNA-103 as Inhibitor for dyslipidemia by repressing ANGPTL8 gene (2020)	Dr. Mohamed Abufarha	Dr. Jehad Abubaker Prof. Fahd Al Mulla Preethi Cherian Irina Alkhairi
33024.02	2021	Use of MicroRNA-181d as Inhibitor for dyslipidemia by repressing ANGPTL3 gene (2021)	Dr. Jehad Abubaker	Dr. Mohamed Abufarha, Prof. Fahd Al Mulla Irina Alkhairi Preethi Cherian
33024.10	2021	Targeting Signaling Crosstalk Between IL-6 and TNF-α for Preventing MMP-9 Induced tumor growth (2021)	Dr. Rasheed Ahmad	Prof. Fahd Al Mulla

Source: DDI 2022 Achievement Report, Strategy Management Office, DDI.



## RESEARCH IMPACT ON HEALTH OUTCOMES

### RESEARCH -RELATED OUTCOMES



### Research Initiatives

DDI’s objectives include (1) undertaking integrated research initiatives using biomedical, population health, and clinical expertise; and (2) initiating, measuring, and evaluating the impact of research on the prevention and management of diabetes; and are thus encompassed in DDI’s first two Strategic Initiatives referenced below.

#### 1. Epidemiology, Etiology, Genetics, and Pathophysiology of Diabetes

Covers biomedical, population health, genetics, and clinical research through multidisciplinary involvement focused on identifying determinants to prevent and manage diabetes.

#### 2. Prevention and Management of Diabetes

Covers research activities that identify interventions to manage diabetes and associated conditions across various population segments.

### Research Strategic Directions

To achieve the above initiatives and objectives, there are 4 Research Strategic Directions in place. They are as follows:

#### 1. Genetics/omics related to diabetes and metabolic disease.

Through this strategy, we primarily focus on the identification and characterization of genes and gene variants that increase the risk of obesity, diabetes, and related complications in Kuwaiti populations.

#### 2. Epidemiology and public health of diabetes and its complications

We aim to contribute towards the improved health and well-being of individuals with, or at high-risk of developing, diabetes in Kuwait. Researchers actively collaborate with Kuwait’s Ministry of Health through several projects to improve diabetes care in Kuwait.

### 3. Pathophysiology of diabetes and its complications

The overall aim is to investigate metabolic signaling pathways, identify markers linked to metabolic disease, and decipher the mechanisms of energy balance at multiple levels in diabetes.

### 4. Clinical care research and clinical trials

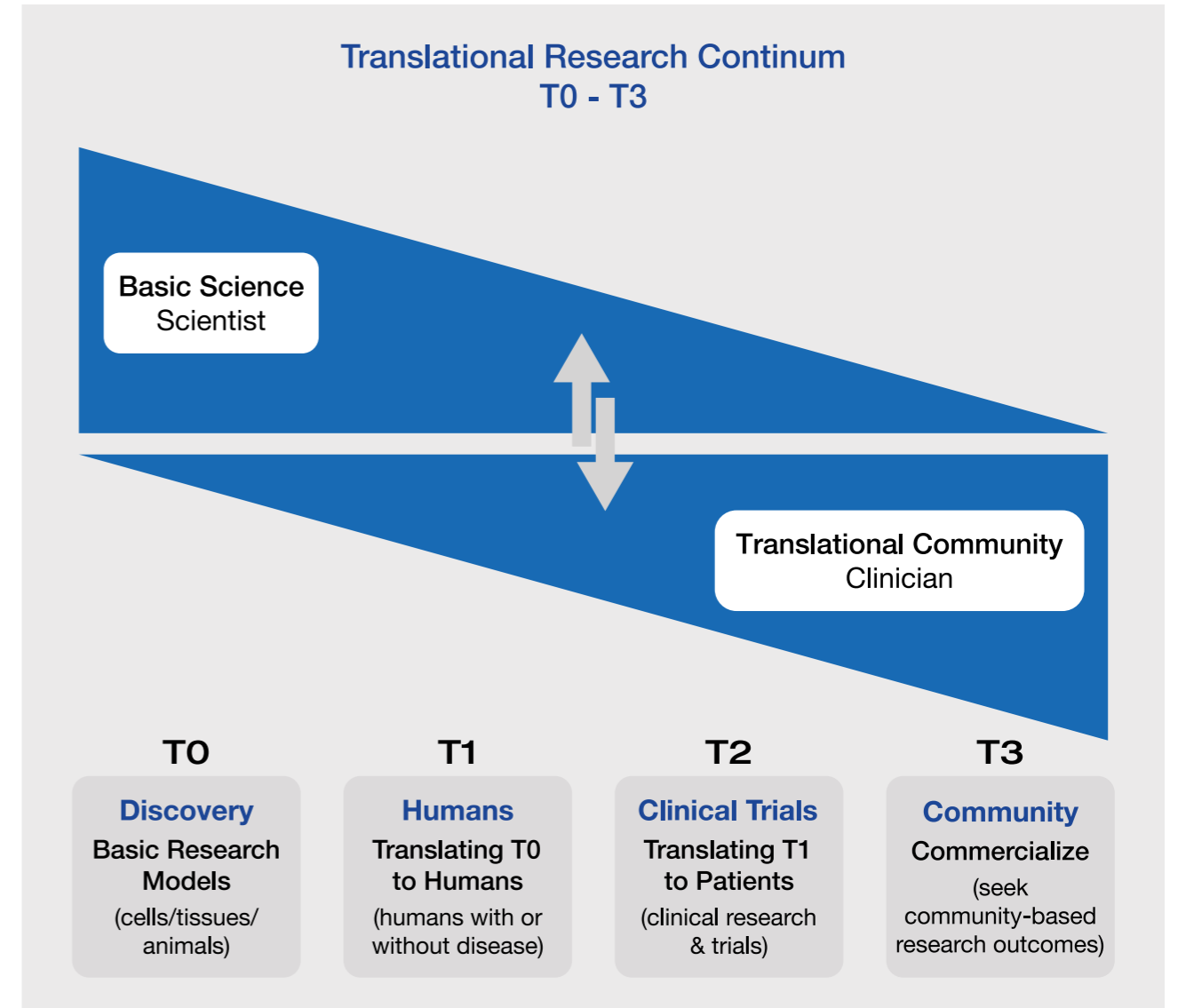
Through this, we aim to implement clinical and interventional studies and methods for excellent care for diabetic patients. The aim is to prevent and manage both diabetes and its complications and to ensure good quality of life of the patient. The Sector designs education and skills development programs for healthcare professionals, patients, partnering organizations, and the general population, which leads to the improvement of healthcare delivery, patient well-being, and diabetes outcomes.

### Translational Research

Translational research is the process by which the findings of laboratory research or preclinical studies are ‘translated’ into novel methods of diagnosis or treatment. The term “bench-to-bedside” is often used to describe the bidirectional continuum in which research findings are propelled from the laboratory (bench) to patients (bedside) and populations, and back to basic research.

The Research Sector at DDI has implemented Translational Research as its core focus. Research is directed towards transforming scientific discoveries into clinically applicable models to reduce the incidence and impact of diabetes and its complications. Through the implementation of translational research practices, scientists aim to ensure that best practices, such as effective prevention strategies, are implemented for the benefit of the patients and communities.

Figure 6. Schematic representation of the continuum of translation research, from bench to bedside, and back, and their definitions.

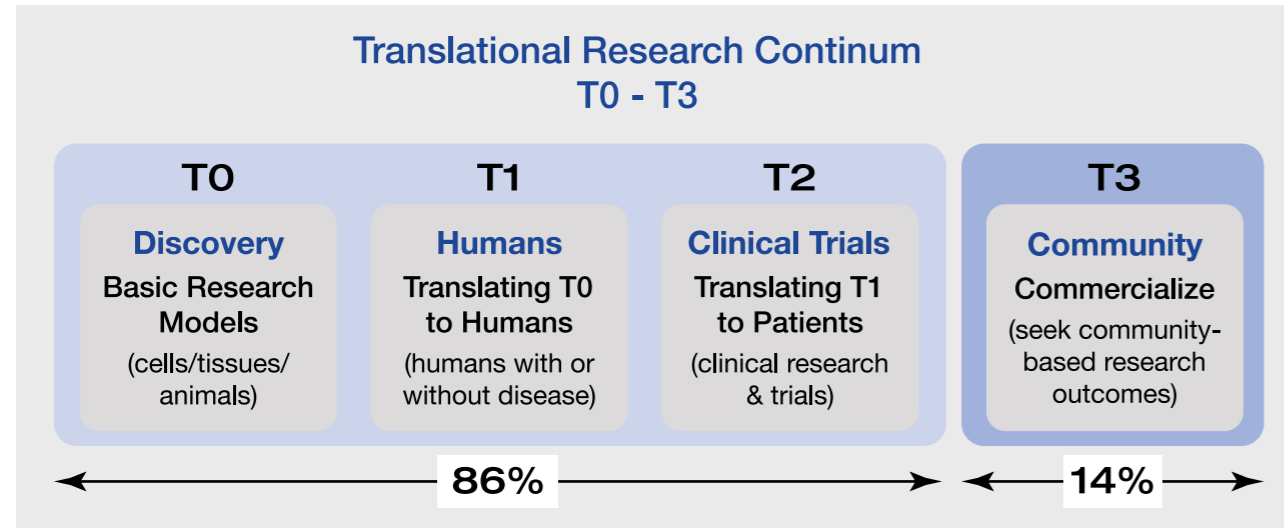


### Definitions

- T0:** Basic research exploring fundamental mechanisms of biology, disease, or behavior, performed in cell, tissue, or animal models.
- T1:** Understanding the concept in humans to design prevention methods based on basic findings.
- T2:** Adopting intervention methods demonstrated to be useful in a research environment to routine clinical care via clinical trials (Phase 1 to 3)
- T3:** Translation to communities; includes population-level outcomes, monitoring benefits and risks, and impacts on policy and change.

## Research Sector Projects

In 2022, there were **38 ongoing projects** and **8 new projects** in the Research Sector. Robust models of translational research were applied to ongoing projects. The breakdown of projects in the Research Sector according to the translational research phase is depicted below. Overall, **86%** of the research projects fell under the **T0–T2 phase** of translational research, while **14%** of the Research Sector projects were under the **T3 phase**.



## PORTAL

Translational Research requires a communication channel to connect scientific discoveries with clinical applications, ultimately improving human health, driving innovation, and addressing societal challenges. The Research Sector aims to empower people and enrich lives by preventing diseases and connecting research to people through **PORTAL** or the **Public Office for Research Translation and Liaison**, which is a brand-new office at DDI that aims to:

- Ensure transparency while informing the public about the important research being conducted at DDI by various research groups and leaders.
- Enhance public participation in research.
- Develop content to engage, attract international health advisories, and research institutions to invest in DDI through collaborations and funding.

PORTAL informs the Kuwaiti population about diabetes and the related disorders, provides access to novel treatments, helps them discover ways to prevent diseases, enables them to receive additional care, and opens a platform for them to be a part of innovation.

## 2023 VISION

The 2023 vision of the Research Sector is “beyond the realms of basic research.” DDI aims to be a global leader in translating groundbreaking scientific discoveries into tangible solutions for the prevention, treatment, and management of diabetes, ultimately improving the lives of the Kuwaiti population affected by the disease. Through this vision, the Research Sector will accelerate innovation and discovery, enhance evidence-based practice, increase interdisciplinary collaboration, and foster positive change in the management of diabetes in Kuwait, and ultimately, around the globe.



# MEDICAL SECTOR

## MAIN HIGHLIGHTS AND ACHIEVEMENTS - 2022

### IDF Centre of Excellence Recognition



The International Diabetes Federation (IDF) - an umbrella organization of over 230 national diabetes associations in more than 160 countries and territories - recognized DDI as an 'IDF Centre of Excellence' in diabetes care.

The Institute is certified as a Centre of Excellence due to:

- DDI's multidisciplinary approach to managing diabetes and its complications; contribution to research and the scientific community; utilization of the latest evidence-based practice to manage all aspects of diabetes care, education, management, treatment, and prevention of diabetes complications, as well as prevention of diabetes.
- DDI's continuous efforts to maintain the highest standards of diabetes care in Kuwait, to encourage and influence quality improvement in diabetes care on a national and regional scale.
- DDI's distinguished educational courses and specialized programs, provided for different age groups of people living with diabetes.
- DDI's advanced training programs that aim to improve the standards and quality of diabetes care. The courses are offered to healthcare professionals that include nutritionists, nurses, podiatrists, educators, and other professionals working in all hospitals affiliated with the Ministry of Health.

This recognition will contribute to strengthening DDI's role at the regional and international levels, augmenting its position as a part of the IDF international cooperative network.

### Basic Surgical Skills Certification



The Clinical Skills Center (CSC) at DDI obtained a Certificate from the Royal College of Surgeons of England to deliver the Basic Surgical Skills (BSS) course.

The BSS course is strongly recommended for all trainees who are about to embark on their first surgical position. Through a series of hands-on sessions, trainees could develop a range of core surgical skills and techniques. Trainees will also learn to use a range of surgical instruments and handle tissue with increased confidence.

## College of American Pathologists Accreditation



The College of American Pathologists (CAP) Laboratory Accreditation Program is an internationally recognized program that has helped the Clinical Laboratory at DDI achieve the highest standards of excellence. The CAP Program's main goal is to improve patient safety by ensuring precision and accuracy in patient results.

### CAP Laboratory Accreditation will ensure that DDI's Clinical Laboratory:

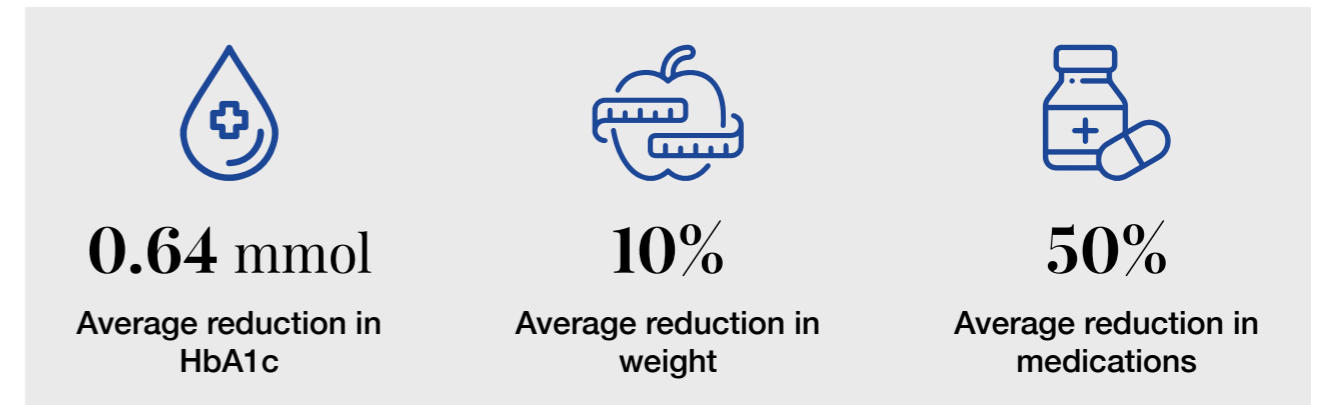
- Maintain accuracy of test results and patient diagnosis,
- Adhere to International laboratory standards and regulations that include Clinical Laboratory Improvement Amendments (CLIA), Food and Drug Administration (FDA) and Occupational Safety and Health Administration (OSHA),
- Stay up to date with the latest laboratory practice and technology,
- Maintain testing consistency at the highest standards of quality and patient care, and
- Provide greater confidence in test results.



## Remission Clinic

The Remission Clinic services have been made available to our T2DM patients that are interested or referred to by their physician. The aim of this service is to provide a well-structured dietary plan to adults with T2DM that can result in diabetes remission at HbA1c <6.5%, along with significant medication reduction. This is the only clinic in the GCC where people have been certified and trained by the DiRECT\* trial team from the UK. People who are newly diagnosed can control their diabetes without medications through lifestyle methods only.

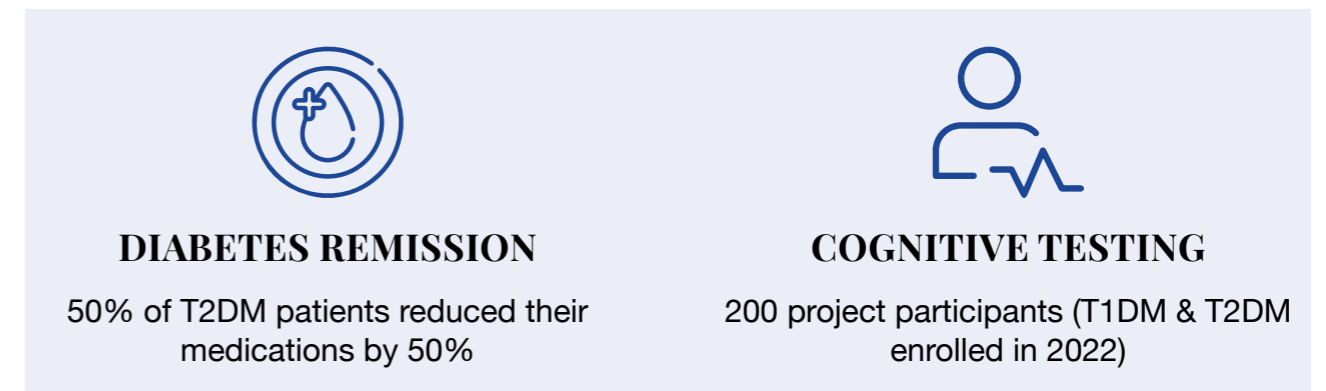
### The 2022 clinical achievements are as follows:



\* The DiRECT trial is a weight management program for persons recently diagnosed with T2DM.

DDI continues to develop clinical projects and programs that aim to improve the quality of healthcare delivery services, patient well-being and diabetes outcomes through behavioral interventions and therapeutics.

### Some key results are illustrated below:



## CLINICAL RESEARCH

With the unique setting of the clinical services in DDI, clinical research and trials are conducted in an easy and smooth manner, where all the needed recruitment and procedures are conducted within the Medical Sector.

We have managed to raise awareness about the importance of diabetes research and increased participation rates from 11% to 40% across our Kuwaiti patient population. **In 2022, we have published a total of 18 publications (original publications – 5, reviews, editorials, comments, others -13) and a median impact factor of 3.752.**

Some of our ongoing studies include:

- **The vascular brain changes in people with diabetes.**

In collaboration with Sunnybrook Research Institute, Toronto, we aim to identify the key drivers of neurodegeneration in diabetes, including both vascular and Alzheimer's related mechanisms. By studying brain MRI studies and running the first Arabic cognitive (assessment) battery, we aim to assess and address how diabetes accelerates cognitive decline and memory loss.

- **Effects of home-based resistance exercise on body composition, muscle strength and glycemic control in people with type 2 diabetes**

We have completed trials looking at the impact of resistance exercise in people with T2DM. Our aim was to promote exercise despite our hot climate and determine whether short home-based exercise (3x per week for 15 minutes), using resistance bands, would enhance muscle function and improve health outcomes. The results of this study have been presented at international conferences and published.

We have previously published 2 chapters in international books on the effect of fasting in T1DM and T2DM, based on our research findings. We are also developing fasting guidelines for T2DM. The Medical Sector has been directly involved in the development, publication, and dissemination of a White Paper on the Roadmap for the prevention and control of diabetes in Kuwait, in collaboration with Novo Nordisk.

We are always striving towards enhancing the recognition of DDI regionally and internationally, which we were able to do through our multiple oral and poster presentations at regional and international conferences (ADCES, ADA, DUK, AHIMA, AACE, IDF, ISPAD, ATTD).

Patient and public engagement is essential for all research, and we have successfully run two patient engagement events in 2022 with our exercise study participants and our DAFNE patients (more than 70 attendees) where we shared the results and received feedback and suggestions.

People with diabetes have shown their interest in engaging even more in exercise trials where they found it very useful. DDI is always striving to look for innovative ideas to engage people in lifestyle interventions.

## COLLABORATIONS

The Medical Sector has established and sustained its collaborations with many national, regional, and international institutions; these include DAFNE UK (DUK), University of Glasgow, Ulster University, Tufts University, Sunnybrook Research Institute, World Health Organization (WHO), Kuwait University (KU), Public Authority for Food and Nutrition (PAFN), and Ministry of Health (MoH).

Through our collaboration with Tufts University, we have been participating in the International Weight Control Registry, highlighted as the best recruitment site. We are also a World Obesity Federation Center. Through our T1DM pioneering work, we have been successful in being part of the EU Sophia Consortium. We locally collaborate with the Primary Care on the Obesity Pathway and the Kuwait Obesity Association and launched the White Paper and obesity debriefing book as a result.

## EDUCATIONAL PROGRAMS & WORKSHOPS

**For people with type 1 and type 2 diabetes (T1DM & T2DM)**

### KICK-OFF

Kids in Control of Food, or KICK-OFF, is a 4-day structured group education program targeting patients with T1DM (aged 11- to 15-years-old) and their parents. Since 2015, the Education and Nutrition Units have collaborated to provide an evidence-based educational curriculum. This program aims to enhance glycemic control and foster self-management skills to manage hypoglycemia, hyperglycemia, sick days, and ketoacidosis. It also aims to reduce the risk of long-term diabetes complications and improve the quality of life.



**170 KICK-OFF graduates**



**Presented International in  
ADA, ISPAD, IDF\***

\* American Diabetes Association (ADA), International Society for pediatric and adolescent diabetes (ISPAD), and International Diabetes Federation (IDF).

## WICKED



18 graduates



4 courses in February, June, August, and September 2022

The WICKED (Working with Insulin, Carbohydrates, Ketones and Exercise to manage Diabetes) course was first launched at DDI in February 2022, targeting adolescents living with T1DM (ages 15 up to 18 years).

This UK-adapted structured educational course was introduced in the Institute to bridge the gaps between two educational programs, KICK-OFF for children and DAFNE for adults living with T1DM. The main aim is to equip adolescents living with T1DM in Kuwait with the tools and knowledge to optimally self-manage their blood sugar levels.

WICKED follows a patient-centered approach, encouraging patients to attend, share, understand and value their experiences in a therapeutics peer-supported environment.

The program development was presented at the international conference the American Association of Clinical Endocrinology (AACE) in Middle East and North Africa in 2022.

WICKED is considered a pre-DAFNE (Dose Adjustment For Normal Eating) course that will helpfully ease the transition of young people to the widely implemented and well-structured evidence-based program for adults – DAFNE.



## DAFNE Kuwait

Dose Adjustment For Normal Eating, or DAFNE, is a structured education program adapted from the original UK-based DAFNE course for adults living with T1DM. The DAFNE program introduces a way to learn skills necessary to estimate carbohydrates in each meal and inject the correct insulin dose.

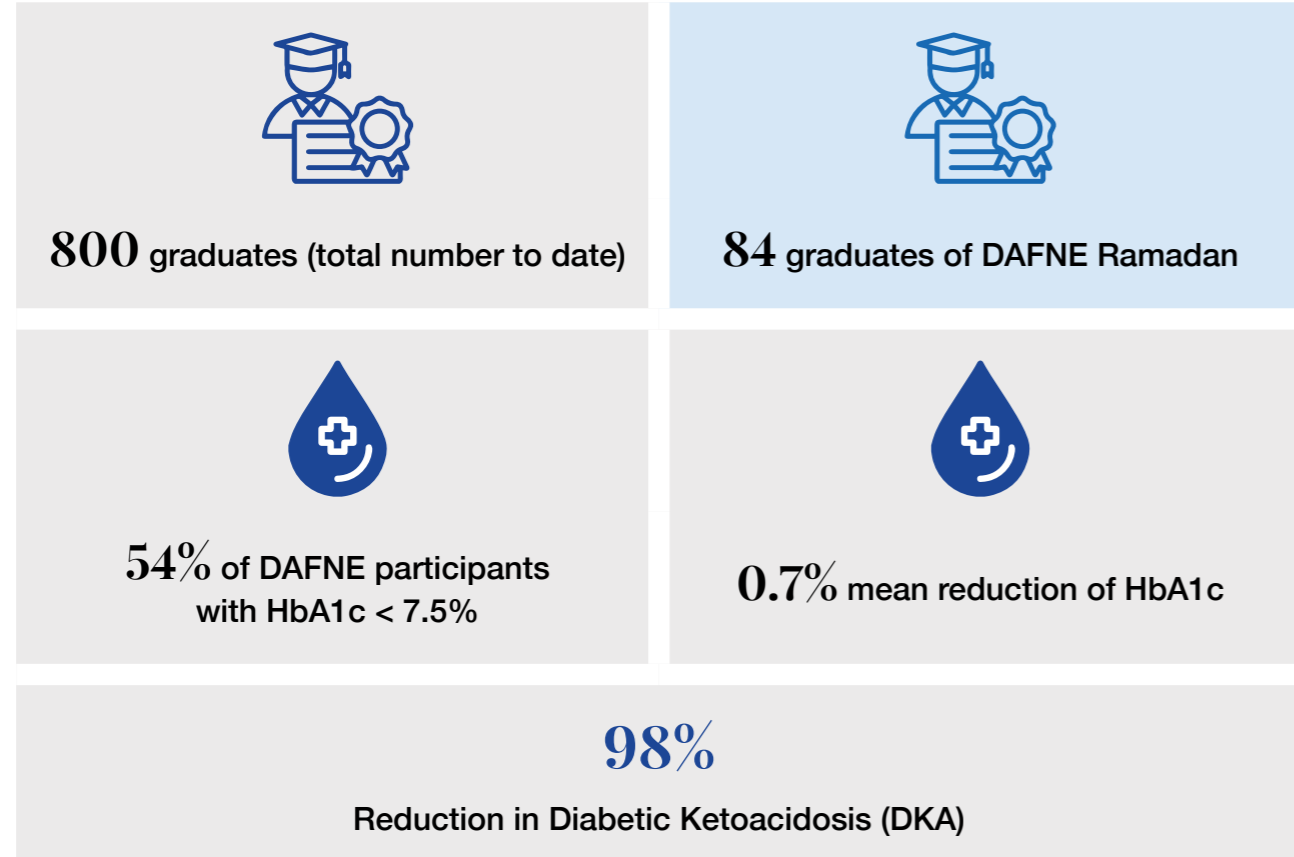
The DAFNE program's mission is to provide fundamental knowledge and essential skills for people with T1DM through structured education and hands-on training. The aim is to empower people towards self-management and to promote overall health and quality of life. It helps people fit diabetes into their lifestyle, rather than changing their lifestyle to fit in with their diabetes.

DAFNE's vision is to provide facilities and support to people living with T1DM to live a normal and healthy life as possible and reduce the future risk of complications.

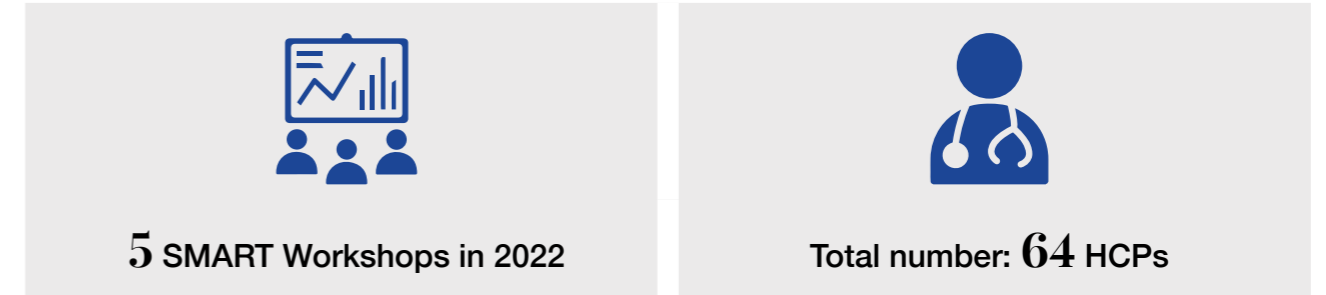
The DAFNE program has also pioneered diabetes care in Ramadan, with an annual workshop being held for graduates. In 2022, **the workshop took place over 2 days for a total of 84 graduates**. The results and success of the DAFNE program have been presented in major radio shows and National TV and have been published in high impact journals and presented at various regional and international conferences such as the ADA, IDF, DAFNE UK (DUK), and the Association of Diabetes Care and Education Specialists (ADCES). The DAFNE program is a prime example of how education has a significant impact on the community with a reduction in hospital admission and ambulance calls.



Kuwait and is the only licensed training center in the MENA region. We have **over 800 graduates** from the course who are being followed up, and below are the clinical outcomes achieved:



### SMART Workshop (Available in basic and advanced levels)



The Education and Training Unit at DDI has always strived to keep healthcare professionals' knowledge up to date by using the IDF curriculum and the ADA Standards of care. The Specific, Measurable, Achievable, Relevant and Time-bound (SMART) course was designed to optimize diabetes management and the prevention/delay of diabetes-related complications.

### Diabetes Journey Workshop

Diabetes Journey, established in 2022, is a new education initiative that aims to provide practical skills to manage T2DM and to deal with day-to-day challenges. It is an interactive 4-hour workshop that welcomes DDI and non-DDI patients to help them optimize their diabetes self-management by improving their knowledge and understanding their condition. The Workshop is delivered by diabetes educators, from the Education and Training Unit, in collaboration with dietitians, from the Nutrition Unit. At the end of the workshop, a diabetologist joins the session to address all attendees' concerns and answer their questions. The workshop is built around group activities, with participants sharing experiences and talking about what T2DM means to them.



## EDUCATIONAL PROGRAMS & WORKSHOPS

For healthcare providers

### PAAET & MOH nurses/educators clinical training

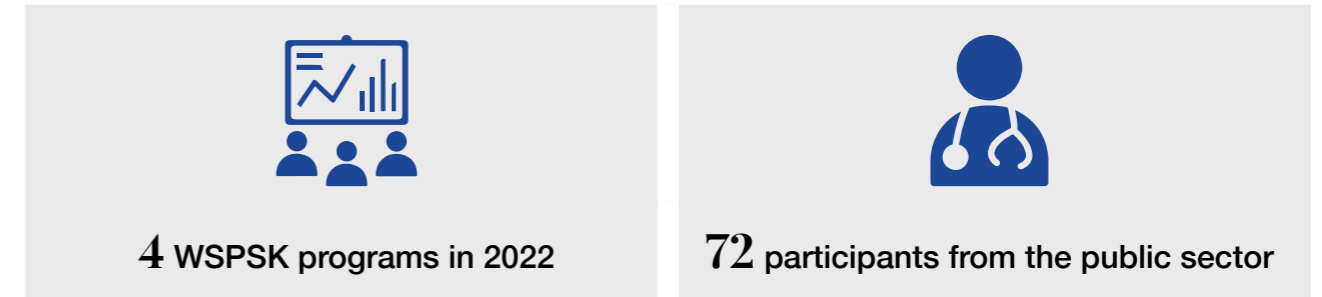
In efforts to raise diabetes care standards in primary and secondary care settings, the Education and Training Unit provided an advanced clinical training program for nurses and health educators. This training program provides unique practical learning experience, where participants are introduced to DDI's clinical services



and allowed to shadow clinicians to link their practical to theoretical knowledge. Clinic shadowing occurs in collaboration with other medical sector units and may include but are not limited to the following learning objectives:

- Develop strong communication skills with the patients and learn about patient interviewing etiquette.
- Understand and demonstrate diabetes educator's role with people with diabetes (adolescents with T1DM and adults with T2DM).
- Identify significant factors related to behavioral changes and fundamentals of motivational interviewing.
- Discuss cognitive, emotional, social, and economical barriers and strategies to patient's/family's self-care approach.
- Observe the process of comprehensive diabetes care from a diabetes education perspective (including medication review and/or lifestyle interventions).
- Explain treatment and prevention approaches to acute and chronic diabetes complications.
- Recognize different laboratory parameters used for early detection of any diabetes-related complications (e.g., microalbuminuria).
- Develop basic skills of calculating insulin sensitivity factor, correction dose, insulin dose adjustment techniques and interpreting daily glucose patterns.

## What School Personnel Should Know (WSPSK E-Learning Program)



Many children with diabetes spend most of their waking hours at school or any other child-care setting. Therefore, it is important to ensure that the school staff are knowledgeable and well-trained to provide a safe environment. This one-day E-learning program offers opportunities for school nurses and teachers to learn and understand the needs and daily challenges of children with diabetes. This includes hypoglycemia, hyperglycemia, frequent glucose monitoring, insulin administration, and the effect of diet and physical activity on blood glucose levels. The WSPSK Program ensures that school staff are well equipped to manage children's daily diabetes-specific needs, reduce any diabetes-related risks, and manage diabetes emergencies.

### SAAD Academy (Youth Internship)

DDI offered 6 young people a chance to explore their occupational interests in the medical field. They were given the opportunity to learn, discuss, and shadow the practice of their desired profession by attending different clinical services at DDI such as adult and pediatric diabetology clinics, education clinics, nutrition clinics, and pharmacotherapy clinics. This empowers high school students to choose the best career path suited towards their skillset.

### Online Diabetes Management Program

With the advent use of technology and the necessity for distance-learning during the COVID-19 pandemic, the Education and Training Unit launched an online comprehensive program for healthcare professionals who are interested in expanding their knowledge and learning about up-to-date diabetes best practices. This course has been designed according to the latest guidelines of the ADA and IDF to reinforce the scientific knowledge and expertise of healthcare practitioners in diabetes. It is a self-paced certificate program that covers diabetes classifications, pathophysiology, screening and diagnosis, complications, and pharmacotherapy and lifestyle modification approaches.

The course targets healthcare professionals (doctors, diabetes/health educators, nurses, pharmacists, nutritionists, podiatrists, etc.) and health sciences students.

The course is delivered through 8 modules. Each module provides audio recordings of lectures, printable materials, and assessments that are designed to maximize the learning process. Upon completion of each module, participants must undertake an online assessment (with multiple choice questions and true or false format). Immediate feedback is given after each assessment with the rationale of the correct answer when applicable. **Certificate of Completion will be auto generated upon completion of all components with 8 CME Credits.**

The course is accessible from:

<https://edu.dasmaninstitute.org/course/diabetes-management-program/>

### Education Clinics (Adult & Pediatric)

Diabetes Educators work closely with patients and the multidisciplinary team to reach optimal glycemic and other metabolic therapeutic targets. The Education and Training Unit offers educational sessions for pediatrics with T1DM and adults with T2DM through education clinics. These interactive sessions aim to empower patients to self-manage their diabetes by providing knowledge, motivation, and support.



**4,153** patients seen across the education clinics

Educational topics covered in the clinic include optimizing medication and insulin, weight control, glucose levels monitoring, intensive insulin management, insulin pump therapy, prevention and early detection of diabetes complications and diabetes emergencies, stress management, risk reduction, and problem-solving.

### Diabetic Retinopathy Workshops



**120** HCPs completed the workshop


In our efforts to enhance the skills and knowledge of HCPs in primary care across the MoH, DDI collaborated with the Primary Healthcare Directive and conducted multiple Diabetic Retinopathy workshops. Diabetic retinopathy is the most common cause of blindness in T1DM and T2DM, of working age group. The aim of these

workshops is to educate HCPs in Primary Care on the standard screening procedures, different stages of diabetic retinopathy and how to identify them, and the appropriate guidelines for referral.

### Prevention and Management of Diabetic Foot Complications Workshop

(In collaboration with the World Health Organization)

Since 2021, the Podiatry Unit has developed and conducted several Diabetic Foot Workshops aimed towards improving the knowledge and skillset of HCPs when managing the diabetic foot in primary health care setting. Upon completion HCPs will be able to provide podiatric assessments, appropriately classify foot risk, provide appropriate self-care education, successfully identify and effectively manage diabetes related foot complications, and know when to refer for specialist care. The curriculum was developed in DDI and approved by the WHO and is a step forward towards DDI becoming a WHO Collaborative Center.



**21** HCPs completed the workshop



### Clinical Skills Center

The Clinical Skills Center (CSC) is a facility dedicated to the education, training, and assessment of students, healthcare professionals, and the public for health, safety, and simulation courses. The CSC is an approved and accredited by the American Heart Association (AHA) as an International Training Center. All courses offered by the Center are registered at Kuwait Institute for Medical Specialization (KIMS).



Courses registered at KIMS



Courses accredited by AHA



Courses provided to **1,654** participants



**372** courses conducted

## OTHER MEDICAL SECTOR ACHIEVEMENTS

No-shows have a detrimental effect on health economics. With the implementation of our no-show policy, we have successfully reduced our no-show rate; in adult diabetology the rate was reduced from 18% in 2019 to 9% in 2022. This allows us to deliver better quality of care and reduce wastage of resources and HCPs' time.

- Only podiatry-led foot clinic in Kuwait that offers treatment, screening, education, and training.
- Improved foot risk categorization of patients on our electronic health records
- 53 foot ulcerations treated; 100% neuropathic ulcerations fully healed at 12 weeks
- Set up one-stop clinic for retinal and foot screening by nurses; first of its kind in country and region.
- Set up Patient and Family Advisory Council to gain patient voices/perspectives and help us incorporate this in all aspects of DDI, from clinical services to media plans, to research.
- Implemented a first of its kind cognitive screening program with full psychometry analysis.
- Development of educational and patient awareness materials in electronic form, such as Carbs and More e-book, podiatry leaflets, and pharmacy medication QR codes which patients can scan and learn how to take their medications safely.
- Engage with pharmaceutical sector for educational grants.

## Quality and Patient Safety

The Medical Sector continued to provide diabetes-related activities, integrating clinical care research and trials, education, prevention, and management to ensure patient safety and quality. It is a fundamental pillar for promoting enhancements in prevention, education, diagnosis, and therapies by combining disciplines, resources, expertise, and techniques within its function. Quality activities were built on the defined set of quality dimensions that were outlined in the Accreditation Standards by Accreditation Canada; population focus, accessibility, safety, work-life, client-centered services, continuity of services, appropriateness, and efficiency.

## Quality Plans

The Quality and Patient Safety (QPS) team worked with each Unit at the Medical Sector toward raising the level of quality through incorporating quality activities into their workplans.

## Patient Satisfaction and Complaints

Patient complaints were being managed through the Patient Liaison Officer and reviewed by members of the Quality and Safety Management Committee (QSMC) to improve the quality of services provided to DDI patients. In addition, a Patient & Family Advisory Council (PFAC) has been introduced and is planned to be operational once patients are being recruited as members.

## Standards of care

DDI follows the latest ADA guidelines and performance is measured against compliance with these standards of care. Furthermore, the patient care pathway has been redesigned to be aligned with the strategic objectives of prevention and management of diabetes and its complications.

## Patient safety

Patient safety activities are implemented through the joint effort of the Medical Sector Units, QPS Team, QSMC, the Emergency & Safety Committee, and the ERM Committee at DDI. Furthermore, the risk registry for the Medical Sector related incidents is regularly updated on an annual basis. The proposed mitigating factors and preventative measures for these risks are accordingly discussed and managed through the ERM committee at DDI. Patient Safety related incident reports are also being reported to the Ministry of Health semiannually, in accordance with the MOH decree (311/2015).

# OPERATIONS SECTOR

## Electronic Health Records (EHR)

DDI recently signed a development continuation agreement with its EHR partner Myca. The Health Informatics Unit plans to introduce major new features to the EHR, including prescription safety tools, medical device integrations, and a patient portal. The agreement includes a code handover process which will enable DDI to have full access and control of the system for in-house development.

## Tableau

Tableau is the primary reports-builder tool for the Medical Sector. The Health Informatics Unit has delivered a wide range of dashboards to monitor and improve patient care quality and assess the performance of staff. Dashboards have also been created to automate recurring processes such as physician payments.

## HIPAA Compliance

The IT Department has successfully renewed its HIPAA compliance for 2022-2023. HIPAA helps ensure the confidentiality of patient data. It does so by assessing DDI's processes for managing, storing, and sharing of patient information.

## Research Support

The Health Informatics Unit continues to support internal and external research on diabetes in Kuwait. It does so by providing ethical committee approved studies with anonymized EHR data and assisting the researchers with data analysis. The Unit also assists the Population Health Department at DDI with their joint DDI/MOH projects, including the National Diabetes Registry, and the National Population Health Survey.

## Learning Management System

In collaboration with the Medical Sector's Education & Training Unit, DDI's IT Department created an online educational platform: [edu.dasmaninstitute.org](http://edu.dasmaninstitute.org). This platform hosts online educational courses for patients and healthcare professionals.

## Internships

DDI's IT Department continuously hosts interns from Kuwait University. Introducing them to IT in healthcare and its crucial role in the care quality of patients. The interns also get exposure to all parts of the IT team, including network, infrastructure, development, help desk, and the Health Informatics Unit. A promising intern was recently hired at DDI IT full time upon her graduation.

## DasmanSwitch

DasmanSwitch is a collaborative project, between DDI's GeoHealth Lab and The George Institute (TGI), aimed to improve the quality of life of people in Kuwait. DasmanSwitch is a data-technology platform consisting of an online database system called the Content Management System (CMS), and an mHealth app with an unprecedented filter tailored for people with diabetes called the DiabetesSwitch.



DASMANSWITCH

### DasmanSwitch QR Codes



We believe our app is distinguished by its idea of encouraging users to change their lifestyles to be healthier by following the rule of “alternatives” instead of “dos and don'ts” to their diet. This should facilitate continuity for them [app users] which is crucial knowing that “It is not a short term diet: it is a long term lifestyle change”.

### 1. Dasmanswitch App

Our DasmanSwitch App (formerly known as FoodSwitch Kuwait) empowers individuals to make better food choices when shopping at the cooperative society. It provides simple nutritional information on a packaged food product and suggests healthier alternatives to 'switch' to. It also provides a personalized experience for people with or without diabetes to fit their nutritional needs.

The App is free, available for both Android and iOS mobile phones and targets people with diabetes or anyone who wants to eat healthy, track calories, avoid gluten or look for products that are low in sugar!

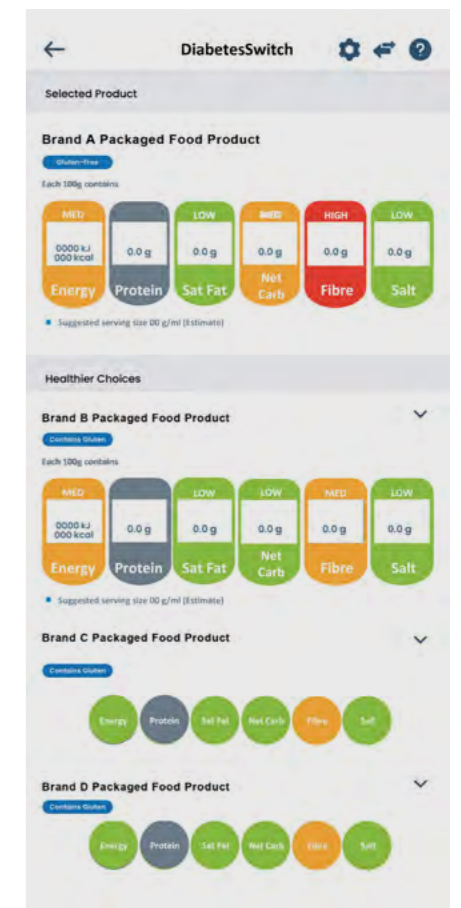
### How It Works?

- After downloading the DasmanSwitch App on your mobile phone and by scanning the barcode of a food item, the App presents you with immediate, easy-to-understand information about that product's nutritional make-up.
- Results are presented as either a simple 'Health Star Rating' which scores a food between 0.5 stars (least healthy) to 5 stars (healthiest), or as color-coded 'traffic light' icons that show key nutrients as **green** (good), **amber** (so-so) and **red** (bad).



- DasmanSwitch also presents a list of similar foods that are healthier alternatives for you to 'switch to'.
- These alternatives are filtered according to your choice from the following Switch filters that reflect your nutritional need:
  - » Classic FoodSwitch—To make overall healthier choices based on the amount of fats, sugars, salt, energy, protein, dietary fiber, fruits, vegetables, nuts and legumes (FVNL) content and for some products, calcium.
  - » EnergySwitch—To make healthier choices with reduced Calorie intake. Ex: High cholesterol patient.
  - » SugarSwitch—To make healthier choices with lower sugar content. Ex: Low-carbohydrate diet follower.
  - » DiabetesSwitch is specifically designed for people impacted by diabetes to help them better manage their diet. It considers the level of nutritive carbohydrates or Net Carbs.
    - Results displayed in TLL mode only
    - Provides information relevant to the condition: Energy, Protein, Sat Fat, Net Carbs, Fiber, and Salt

*Note: DasmanSwitch App is available in Arabic only, but the screenshot is translated in English for illustrative purposes.*



- In addition, the gluten tag below the name of the products is presented for people impacted by celiac disease or other gluten-related sensitivities to help them easily identify their gluten status.

See for yourself why we are the world's most popular health and fitness app!

## 2. Content Management System

The CMS is an online database system licensed to Kuwait to manage its Food and Beverage Information (FBI). The system was integrated with the GeoHealth Lab infrastructure resulting in the creation of a data bank that offers a comprehensive nutritional profiling system for human packaged food products in Kuwait. The present 18K records not only enrich our database enabling research into food environments and dietary patterns from a spatial perspective but are also useful for DasmanSwitch App users and decision-makers in Kuwait.

CMS raw data are photos of food products captured either through coop data collection projects undertaken by the GeoHealth Lab team or crowdsourced from users of the DasmanSwitch App. These images are reviewed by our Data Entry team to enter information for new products and review those for older products. Then, all approved products are finally reviewed by the Data Manager to ensure the information is correct and current. During this process, our team will also report products with false or misleading labeling to our Collaborator, the Public Authority for Food and Nutrition (PAFN) to act accordingly, with their manufacturers.

Based on the above, we encourage all consumers to use the DasmanSwitch App and share photos of products not available in it and to participate in our community surveys.

## 3. Achievements

### 15 February 2022

As planned last year, the DiabetesSwitch filter logic and cut-off values for nutrients to be displayed in the App have been finalized. And on Tuesday, 15 February 2022, Dasman Diabetes Institute **officially launched the DasmanSwitch App and its diabetes filter** at Al-Rawda & Hawally Cooperative Society. The inauguration was attended by Dr. Qais AlDuwairi, H.E. the Australian Ambassador to Kuwait and other senior managers from the Institute and relevant authorities in Kuwait.



### October and November 2022

In collaboration with TGI, PAFN, and Adailiya Cooperative Society, Dasman Diabetes Institute GeoHealth Lab team completed the planned biennial **DasmanSwitch data collection** aimed at collecting new packaged food products and reviewing nutritional information for older products that may have been updated by manufacturers. A series of group visits to Adailiya Coop were organized to complete this project.

### December 2022

Dasman Diabetes Institute GeoHealth Lab team conducted a **DasmanSwitch App marketing campaign** in the cooperative societies. Two coops from each governorate, with a total of 24 coops in Kuwait, were visited to present the App to customers and survey them.

## 4. Future Plans

Being one of the most frequent suggestions in the survey conducted during the DasmanSwitch Coop Marketing Campaign 2022, ongoing discussions on the allergens feature have been held with KFAS and TGI for future implementation in the DasmanSwitch App.





## 5. Research

**[5-8 December 2022]** DasmanSwitch was published as an e-Poster in the **IDF World Diabetes Congress 2022**.

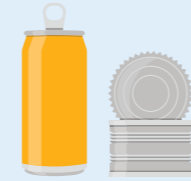


To tackle our mission, DDI launched one of the most important organizational projects called DasmanSwitch. This data-driven mHealth intervention is a science-based cost-effective solution as it supports both aims of the Institute:

- **Research**—by facilitating collaborative work and offering promising opportunities in the future.
- **Treatment**—by implementing the DiabetesSwitch filter driving the DasmanSwitch App to be considered a successful Diabetes Self-Management (DSM) app.

*We believe our app is distinguished by its idea of encouraging users to change their lifestyles to be healthier by following the rule of “alternatives” instead of “dos and don’ts” to their diet. This should facilitate continuity for them which is crucial knowing that “It is not a short term diet: it is a long term lifestyle change”.*

 <p>Launched in <b>10</b> countries (Parent FoodSwitch App)</p>	 <p>Kuwait <b>1<sup>st</sup></b> FoodSwitch licensed country in the MENA region</p>
 <p>One of the most trusted apps for health advice*</p>	 <p><b>1<sup>st</sup></b> diabetes-focused filter in the World</p>

\* Parent FoodSwitch App was certified by ORCHA with a review score of 74% in 2020

 <p>Offers simplified nutrition info on packaged food</p>	 <p>Helps improve existing food environment</p>
 <p>Empowers individuals to make better food choices</p>	



# PUBLIC AWARENESS ACTIVITIES

## Public Awareness Activities

DDI's activities and initiatives aim to reflect our mission: to address the diabetes epidemic in Kuwait through focused diabetes research, integrated prevention, training, and education. Therefore, the Institute utilizes multiple platforms to:

- Engage the public in DDI's ongoing activities, campaigns, initiatives, and events.
- Raise awareness on diabetes management, treatment, and prevention.
- Advocate for a healthier lifestyle through TV and Radio interviews.
- Highlight DDI's accomplishments on mass and social media.
- Provide easy and accessible educational resources.
- Improve public awareness on diabetes and health related conditions.

### 2022 DDI Activities



**63**

Activities



**54**

Awareness Information



**54**

Press Releases



**92**

Health Awareness Videos  
& TV/Radio Interviews



**519**

Public Awareness  
Posts

## Activities

Throughout 2022, DDI has had an array of activities that include conferences, seminars, workshops, lectures, and more. These activities are all educational in nature whether for the public, medical professionals, scientists (people within the sciences), or children.

### LECTURE, WORKSHOPS, CONFERENCES

#### For Healthcare Professionals

##### 1. Prevention & Management of Diabetic Foot Complications

In collaboration with the Primary Healthcare Department of the Ministry of Health, the Medical Sector's Podiatry Unit held a specialized three-day course on the Prevention & Management of Diabetic Foot Complications. In this intense course, healthcare professionals were trained to assess and treat podiatric (foot) conditions in people with diabetes using evidence-based assessments and treatment methods, aimed to reduce diabetic foot ulcerations and amputation.

##### 2. Diabetic Retinopathy Workshop

The Medical Sector's Ophthalmology Unit held a two-day workshop for Ministry of Health ophthalmologists. This workshop aimed to highlight pathogens and signs of diabetic retinopathy, screening of diabetic retinopathy, stages of diabetic retinopathy, optical coherence tomography (OCT) interpretation, case studies, and guidelines for referral.

#### For Scientists and Clinical Researchers

##### 1. Scientific Writing and Clinical Methodology Workshop

Professor Abraham Fingerhut, a prominent surgeon and academician, presented a 2-day workshop that focused on writing, publishing, and reading research papers.



##### 2. Cognitive Behavioral Therapy in Obesity Management

Dr. David Macklin, a lecturer at the University of Toronto Faculty of Medicine and a University of Toronto trained Family physician, highlighted the key principles of obesity treatment, the role of medication in obesity management, and how cognitive behavioral therapy can be used during the treatment process.





### For Students

#### 1. Summer Internship Program

DDI's Summer Internship Program offers a unique opportunity for university students and recent graduates to develop core skills in biomedical and clinical research. Students are given the opportunity to work, supervised, in many diverse diabetes research projects and initiatives.

#### Students can:

- Attend seminars, lectures, and journal club meetings to develop a deeper understanding of research projects,
- Identify and apply research principles and practices,
- Develop an understanding of diabetes and related conditions.

At the end of their internship, students present a poster focusing on their work during the program duration to DDI's employees and visitors.



### For Research Participants

#### 1. Kuwait Adult Diabetes Epidemiological Multidisciplinary (KADEM)

DDI's Research Sector held a public engagement for KADEM, the first longitudinal study conducted by DDI, to discuss the details and findings of the KADEM study and to further involve research participants in future projects.

#### 2. "How does resistance exercise affect Type 2 diabetes?"

The research study, led by Dr. Stuart Grey, from the Institute of Cardiovascular and Medical Sciences, University of Glasgow; Dr. Ebaa Al Ozairi, Chief Medical Officer and

Dr. Dalal Alsaeed, Clinical Operations Manager, held a special function for the research participants at DDI. During the event, the research investigators shared the results of this study and thanked them for their contribution.

**For the Public**

**1. Diabetes Care During Hajj**

DDI's Education and Training Unit held an interactive virtual lecture to offer tips and advice for patients with diabetes to consider when going on Hajj. The information given within this lecture has been summarized in a booklet that has been made available online.

**2. World Diabetes Day**

DDI held its Annual World Diabetes Day event in Al Hamra Tower. This event commemorating November the 14th, the official World Diabetes Day, allowed visitors to consult with diabetes specialists and nutritionists. Visitors also had a chance to gather medical information from the different booths where our professionals could answer more questions on diabetes and maintaining a healthy lifestyle.



**OUTREACH EVENTS**

**DDI Visits AINibras School**

DDI's team of healthcare professionals visited AINibras International Bilingual School. This visit was organized in celebration of World Diabetes Day, where a team of nurses and diabetes educators were present for blood glucose testing, blood pressure testing and to answer any questions about diabetes



**DDI Visits the Council of Ministers' General Secretariat**

DDI's team of healthcare professionals and nursing staff visited the General Secretariat of the Council of Ministers for the diabetes open day held for the secretariat employees. The Institute's team provided blood glucose testing, medical consultations, and physical fitness consultations. The team also provided brochures about diabetes and its complications for the attendees.



## GLOBAL HEALTH AWARENESS: EXPO DUBAI

During health and wellness week, DDI participated in the State of Kuwait's pavilion at Expo Dubai from January 30<sup>th</sup> to February 5<sup>th</sup>, 2022. The Institute showcased some of its exerted efforts in combating diabetes in Kuwait, where diabetes is one of the most prevalent diseases.

The Institute's participation was to spread awareness about the causes of diabetes in Kuwait. DDI also shared its efforts to combat the disease, through structured research studies, the use of the latest technologies to reduce the prevalence of diabetes and managing its complications for those who live with it.



## DIVERSE GLOBAL INITIATIVES

In efforts to mitigate the impact of diabetes of the Kuwaiti population, DDI continues to foster its relationships with foreign embassies. These collaborations provide a beneficial knowledge sharing platform with other reputable individuals and institutions; help strengthen our health systems and provide a different outlook; and introduce alternative strategies to improve the quality of life and overall health of Kuwait's citizens.



H.E. Melissa Kelly, Ambassador-designate of the Australian Embassy in Kuwait



H.E. Aliya Mawani, Ambassador of the Canadian Embassy in Kuwait



H.E. Belinda Lewis, Ambassador of the British Embassy in Kuwait

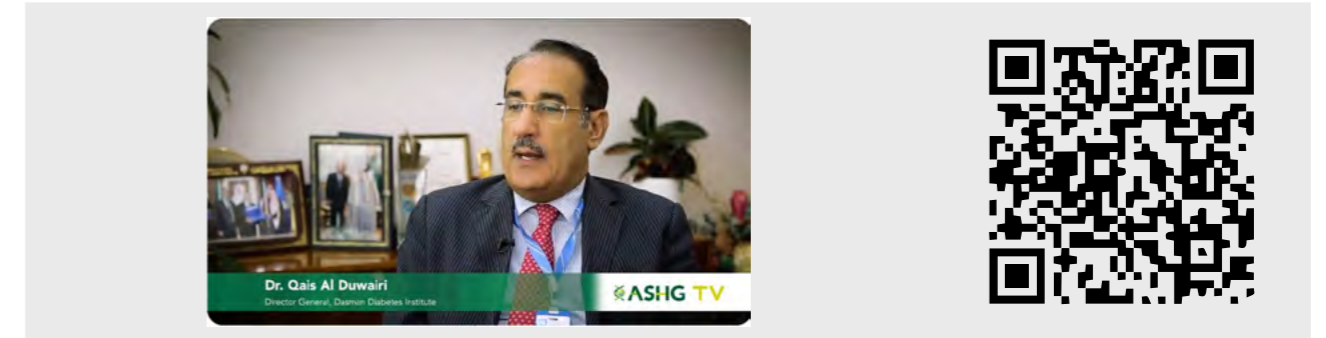
### AWARENESS INFORMATION

DDI's Sectors work closely to develop educational materials to share on our social platforms for maximum reach. These informative posts are meant to be educational and cautionary to ultimately improve health outcomes.



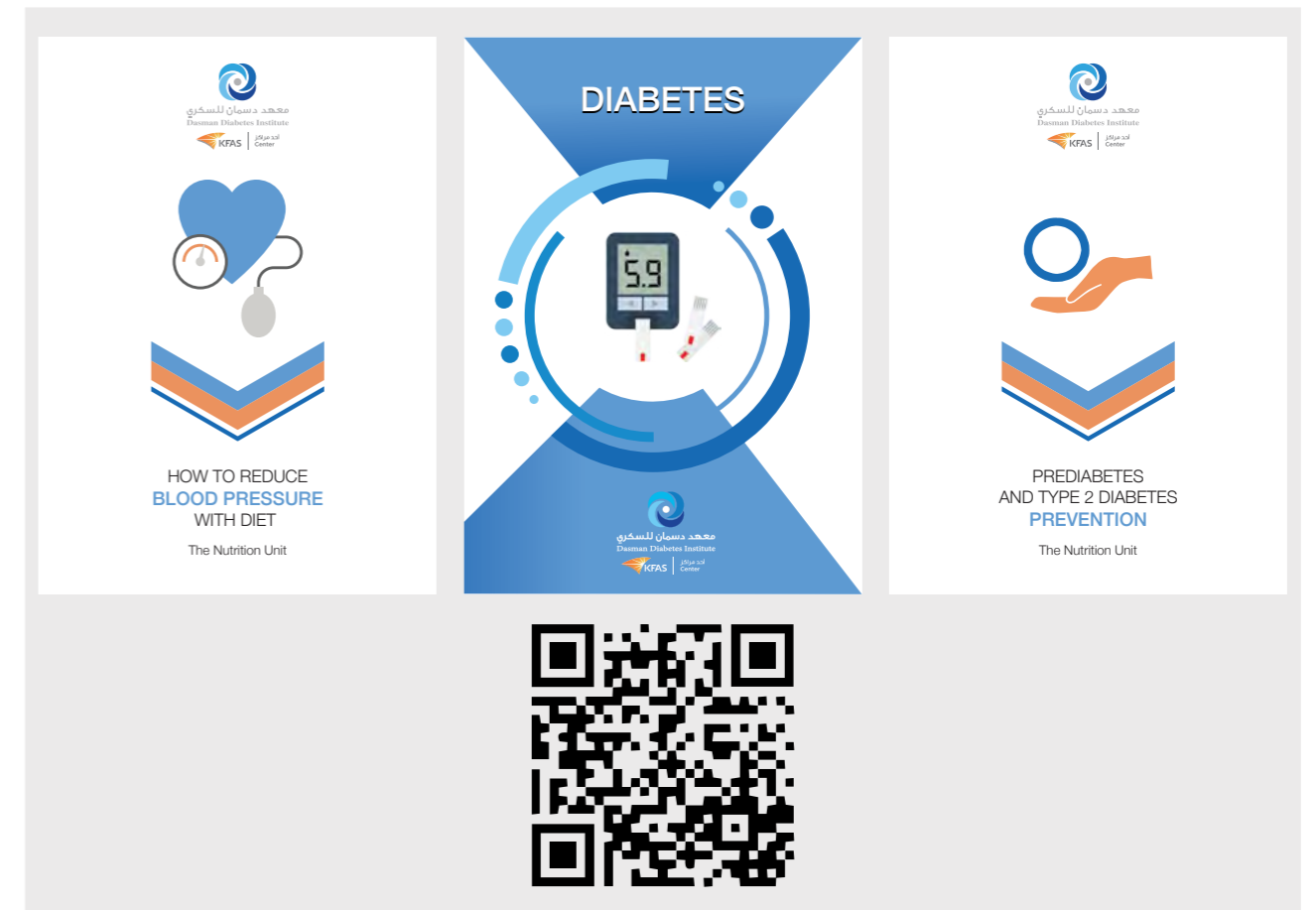
### HEALTH AWARENESS VIDEOS

DDI continuously strives to spread awareness about diabetes, improve people's understanding around specific topics, empower the public to take preventative action, and more. Our health awareness videos include research education, diabetes management and prevention, specialist recommendations, and more.



### EDUCATIONAL RESOURCES

DDI's Departments continuously develop new informative materials that serves to not only complement a patient's treatment plan, but also educate and empower patients to maintain physical and mental wellbeing.



DDI List of Events 2022		
No.	Date (dd/mm/yy)	Description (Objectives)
1	31/01/2022	A team from DDI, participated at the Kuwaiti Pavilion, Dubai Expo, during the week dedicated to Health and Wellness at the Expo.
2	15/02/2022	DDI launched DasmanSwitch mobile App in Coops in Kuwait.
3	17/02/2022	The British Ambassador to the Sate of Kuwait, Her Excellency Belinda Lewis, visited DDI.
4	08/03/2022	DDI took part in the First Conference for Scientific Research organized by the Research Sector in Kuwait University.
5	09/03/2022	DDI has held a function and invited all participants who took part in the research study titled "How does resistance exercise affect Type 2 diabetes?".
6	17/03/2022	DDI held a lecture titled 'Zebrafish as a Developmental Model Organism for Human Disease Research'.
7	21/03/2022	DDI organized a First Aid and CPR Workshop for a group of staff members from the Gulf Bank.
8	22- 24/03/2022	DDI held its specialized three-day course on the Prevention and Management of Diabetic Foot Complications, in collaboration with the Primary Health Care Department at the Ministry of Health.
9	27-28/03/2022	DDI held a two-day workshop titled 'Diabetic Retinopathy' for a group of ophthalmologists from the Ministry of Health.
10	29/03/2022	Virtual Lecture on Ramadan and Type 1 Diabetes for Children and Adolescents.
11	29/03/2022	DDI partakes in a diabetes health awareness campaign in Sabah Al Salem Specialized Clinic.
12	24-31/03/2022	DAFNE Group Activities.
13	06/04/2022	Public Health College's students paid a field visit to DDI.
14	19/04/2022	Dr. Hend AlQaderi represented DDI at the National Oral Health Conference in Texas.

15	19/04/2022	DDI organized a First Aid and CPR Workshop for a group of staff members from the Gulf Bank.
16	20/04/2022	Her Excellency the Canadian Ambassador to Kuwait, Mrs. Aliya Mawani, paid a field visit to DDI.
17	21/04/2022	DDI hosted a group of preschool students from Kuwait Reggio Center along with their parents for a field trip.
18	12/05/2022	DDI organized an outreach event at Ahmed Al Adwani High School for Boys in Adiliya.
19	16/05/2022	The Clinical Skills Center in DDI held a training course in First Aid and CPR for the staff of the Embassy of the Netherlands which was also attended by H. E. the Ambassador of the Netherlands.
20	25/05/2022	DDI participated at an awareness event at College of Life Sciences, Sabah Al Salem University City (Al Shadadiya) by presenting informative material and consultations on how to deal with diabetes.
21	25-26/05/2022	DDI held a two-day lecture series titled "Scientific Writing and Clinical Methodology". The lectures were presented by Prof. Abe Fingerhut MD, FACS (hon), FRCPS (g), FRCS (Ed) hon.
22	30/05/2022	The International Scientific Advisory Board (ISAB), an independent and external scientific advisory board that is appointed by KFAS to strengthen internal research strategies and management capabilities visited DDI.
23	01/06/2022	DDI welcomed its interns to start their Internship Program.
24	02/06/2022	DDI launched its Dasman Diabetes Resource Hub (DDRH).
25	13/06/2022	DDI participates at the Career and Scientific Poster Day event organized by the Life Sciences Center at the Public Health Faculty.
26	15/06/2022	Interactive actual lecture on Diabetes Care During Hajj.
27	15/06/2022	DDI has taken the necessary actions in compliance with the Environmental Protection Measures for Waste Recycle Management.

28	22/06/2022	Interactive virtual lecture on Diabetes Care During Hajj.
29	19/07/2022	The Deputy Commissioner of the Australian Embassy in Kuwait, Mr. Paul Noonan visited DDI.
30	28/07/2022	DDI held its Students Poster Day with the participation of the summer intern students.
31	25/08/2022	DDI's Pediatric Unit held a training course 'KICKOFF' for children with type 1 diabetes.
32	05/09/2022	DDI held a training course for high school graduates focusing on Diabetes Care and its complications under the supervision of Dr. Dherar Alroudhan, Head of Education and Training Unit at DDI.
33	18/09/2022	DDI offered an open day consultation for patients to ask questions about their medications.
34	20/09/2022	DDI's Pharmacy launched its QR Code service.
35	29/09/2022	DDI held a public engagement event on Kuwait Adult Diabetes Epidemiological Multidisciplinary (KADEM), the first longitudinal study conducted by DDI.
36	4-6/10/2022	DDI scientist participates in STS Forum in Japan.
37	06/10/2022	DDI held a special lecture "Update on Diabetes Management" delivered by Prof. Muhammad Abdulghani.
38	11/10/2022	DDI participated at Kuwait Girl Guides Association in commemoration of the International Day of the Girl.
39	12/10/2022	DDI held a special lecture delivered by Dr. Mohammed Al-Onaizi on Elucidating Mechanisms Underlying Cognitive Dysfunction in Type 2 Diabetes.
40	12/10/2022	DDI participated in a health fair for State Audit Bureau's employees.
41	20/10/2022	DDI took part in the health and wellness fair day at the Canadian Bilingual School.
42	25/10/2022	DDI's GeoHealth Lab resumed collecting nutritional facts at Co-ops.

43	26/10/2022	DDI held a scientific lecture delivered by guest speaker Dr. Jibin Chi on Diabetes Management.
44	27/10/2022	DDI participated in a health fair at the Directorate General of Civil Aviation.
45	31/10/2022	Students from Carmel School in Kuwait, visited DDI.
46	6-7/11/2022	DDI held a Diabetic Retinopathy Workshop for healthcare professionals.
47	09/11/2022	Senior Management of DDI met with a delegate from the French Embassy including Dr. Pierre Houpiqian, Counsellor for Global Health in the Middle East.
48	09/11/2022	The Director General of DDI met with H.E. Melissa Kelly Ambassador-designate of the Australian Embassy in Kuwait.
49	10/11/2022	DDI participated in an awareness day at Kuwait Flour Mills and Bakeries Co.
50	11-13/11/2022	DDI participated in the AACE conference held in Dubai.
51	14/11/2022	DDI held their annual informative event to commemorate World Diabetes Day at Al Hamra Tower and Shopping Center.
52	14/11/2022	Dr. Ebaa Al Ozairi, CMO presented an interactive session held by the UAE Embassy in Kuwait about Diabetes and Its Management and Prevention.
53	16/11/2022	DDI participated at an awareness event at Al Nibras Model School for Students with Special Needs.
54	17/11/2022	DDI participated at an Awareness Day at Munera Al Ayar polyclinic in Kaifan.
55	21/11/2022	DDI participated at an awareness event at Sabah Al Salem University City (Al Shadadiya).
54	23/11/2022	DDI participated at an Awareness Day at the National Centre for Education Development.
55	24/11/2022	DDI took part in an Awareness Day at the Arab Fund for Economic and Social Development.

56	24/11/2022	DDI held a scientific lecture on the Role of CBT in Obesity Management delivered by Dr. David Macklin.
57	27/11/2022	Students at The Indian Community School in Kuwait recently visited DDI.
58	30/11/2022	DDI participated at an Awareness Day at the Council of Ministers General Secretariat.
59	06/12/2022	DDI held a training course on Basic Surgical Skills for a group of healthcare professionals.
60	07/12/2022	DDI participated in the “Media Role” a first of its kind Public Relations event at Shadadiya University.
61	08/12/2022	The Nursing Institute from the Public Authority for Applied Education and Training visited DDI.
62	12/12/2022	The International Scientific Advisory Board (ISAB) held its biyearly meeting (virtually).
63	13/12/2022	DDI participated in an Awareness Day at the Public Authority for Housing Welfare.
64	19-21/12/2022	A Team from DDI participated at the ‘Kuwait in Egypt’ Exhibition.
65	26/12/2022	Outreach at Khabab Bin Al-Arath School.

## ABBREVIATIONS

<b>AACE</b>	American Association of Clinical Endocrinology
<b>ABPI</b>	Ankle-Brachial Pressure Index
<b>ADA</b>	American Diabetes Association
<b>ADCES</b>	Association of Diabetes Care and Education Specialists
<b>AHA</b>	American Heart Association
<b>AHIMA</b>	American Health Information Management Association
<b>ANGPTL8</b>	Angiotensin-like 8
<b>ATTD</b>	Advanced Technologies and Treatment for Diabetes
<b>BSS</b>	Basic Surgical Skills
<b>CAP</b>	College of American Pathologists
<b>CAV1</b>	Caveolin-1
<b>CLIA</b>	Clinical Laboratory Improvement Amendments
<b>CME</b>	Continuing Medical Education
<b>CSC</b>	Clinical Skills Center
<b>DAFNE</b>	Dose Adjustment for Normal Eating
<b>DIC</b>	Diagnostic Imaging Center
<b>DKA</b>	Diabetic Ketoacidosis
<b>DUK</b>	DAFNE UK
<b>ERM</b>	Enterprise Risk Management
<b>EU</b>	European Union
<b>FDA</b>	Food and Drug Administration
<b>Ghitm</b>	Growth Hormone Inducible Transmembrane Protein
<b>GIANT</b>	Genetic Investigation of Anthropometric Traits
<b>GLGC</b>	Global Lipids Genetics
<b>HbA1c</b>	Hemoglobin A1c
<b>HCPs</b>	Healthcare Professionals
<b>IDF</b>	International Diabetes Federation
<b>IF</b>	Impact factor
<b>IRF3</b>	Interferon Regulatory Factor 3
<b>IRF5</b>	Interferon Regulatory Factor 5
<b>ISAB</b>	International Scientific Advisory Board
<b>ISPAD</b>	International Society for Pediatric and Adolescent Diabetes

## ABBREVIATIONS

<b>KICK-OFF</b>	Kids in Control of Food
<b>KIMS</b>	Kuwait Institute for Medical Specialization
<b>KU</b>	Kuwait University
<b>MetS</b>	Metabolic Syndrome
<b>MENA</b>	Middle East and North Africa
<b>MoH</b>	Ministry of Health
<b>NCD-RisC</b>	NCD Risk Factor Collaboration
<b>OSHA</b>	Occupational Safety and Health Administration
<b>PAAET</b>	Public Authority for Applied Education and Training
<b>PAFN</b>	Public Authority for Food and Nutrition
<b>PFAC</b>	Patient and Family Advisory Council
<b>PORTAL</b>	Public Office for Research Translation and Liaison
<b>Q1/Q2/Q3/Q4</b>	Quartile 1/2/3/4
<b>QPS</b>	Quality and Patient Safety
<b>QSMC</b>	Quality Safety Management Committee
<b>SMART</b>	Specific, Measurable., Achievable. Relevant, and Time-bound
<b>T1DM</b>	Type 1 Diabetes Mellitus
<b>T2DM</b>	Type 2 Diabetes Mellitu's
<b>VPT</b>	Vibration Perception Threshold
<b>WHO</b>	World Health Organization
<b>WICKED</b>	Working with Insulin, Carbohydrates. Ketones, and Exercise to manage Diabetes
<b>WSPSK</b>	What School Personnel Should Know