ISSN: 2475-6296

Research Article

Journal of Clinical & Experimental Immunology

Investigation of Food and Relative Risk Probability of Having Five Different Diseases, Including Diabetes Using Collected Food Data Over A 6.5-Year Period Based on GH-Method: Math-Physical Medicine (No. 492)

Gerald C Hsu

eclaireMD Foundation, USA

***Corresponding author**
Gerald C Hsu, eclaireMD Foundation, USA

Submitted: 18 Nov 2021; **Accepted**: 23 Nov 2021; **Published**: 30 Nov 2021

Citation: *Gerald C. Hsu (2021) Investigation of Food and Relative Risk Probability of Having Five Different Diseases, Including Diabetes Using Collected Food Data Over A 6.5-Year Period Based on GH-Method: Math-Physical Medicine (No. 492). J Clin Exp Immunol, 6(6): 383-389.*

Abstract

The author is a professionally trained mathematician, physicist and engineer. His view of health and medicine is similar to his past experience on designing a physical object, such as a building structure or a working machine, which he calls an "object". The object's strength or its expected lifespan is similar to the health conditions and longevity of a human being based on the following three key factors:

(1) The original strength of the object's material which is similar to the genetic factors of a human body.
(2) The engineering design and site construction of this object are similar to the fundamental influential causes, including lifestyle details, life-long habits, and environmental factors, on the human health. Among those external causes, if the author has to pick up one category which has the most influence above of all that is the "food".
(3) The object endures different operational problems due to external forces or impacts which are similar to various diseases suffered by humans. After the object experiences external forces or impacts, we use some structural reinforcements to fix the building's damaged cracks or replace the malfunctioned part of the machine. These engineering actions are similar to the "medical treatments" doctors provide patients. The medical treatments, including medication interventions (oral drugs or biochemical injections), necessary surgeries, or certain organ transplants are similar to the engineering repair of the damaged object.

This article emphasizes the relationship between causes and results such as symptoms of diseases. It particularly addresses the inter-relationship of 5 selected diseases: cancers, cardiovascular diseases (CVD), chronic kidney diseases (CKD), diabetic retinopathy (DR), and type 2 diabetes (T2D), where the most important cause for most diseases is "food". This food category in his study contains 25 defined elements include input data of food are collected via the developed iPhone APP. There are 5 elements for "Food Quantity": breakfast amount, lunch amount, dinner amount, amount of between-meals snacks and fruits, and the average daily food consumption amount. In addition, there are 20 selected elements for "Food Quality" (see Figure 1). The combined Food score is the average value of both food quantity score and food quality score.

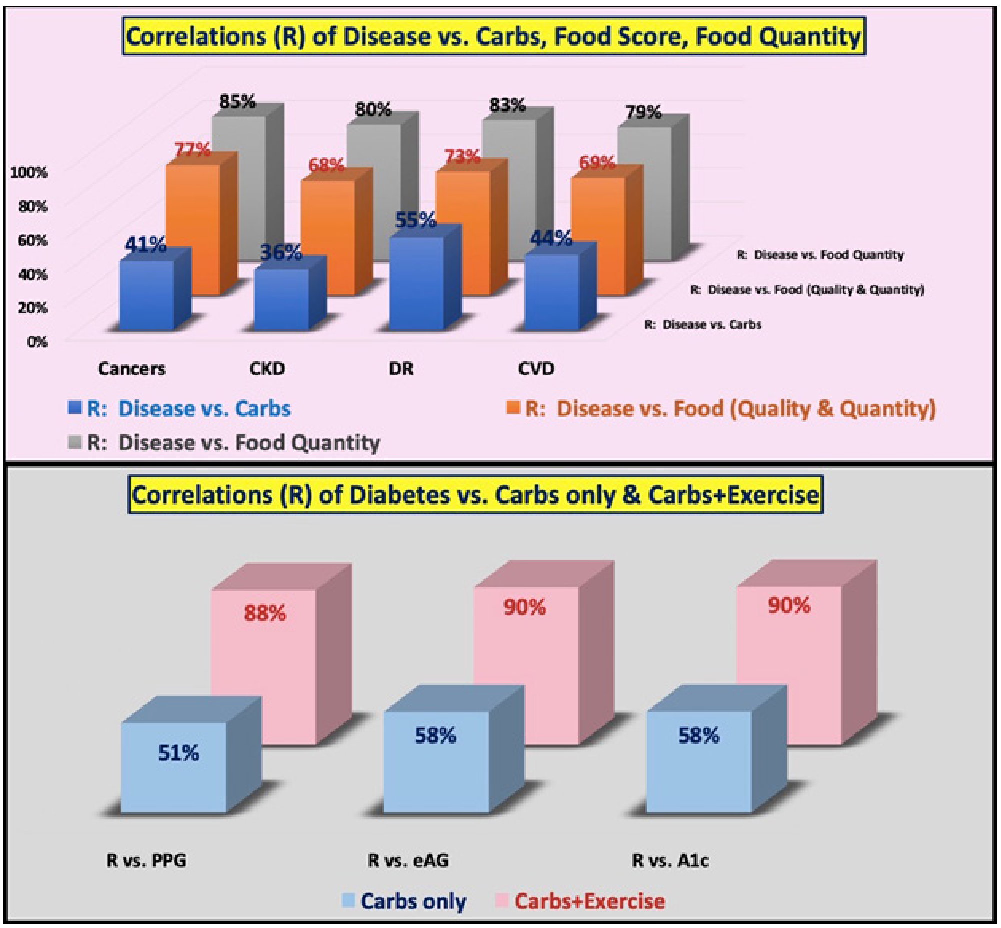
In the US, there were ~2.85 million deaths in 2019 with 10% of total deaths caused by infectious diseases (2020 & 2021 would have a higher number due to the COVID epidemic), while another 12% involved accidents, injuries or suicide. The remaining 78% of deaths are due to various diseases associated with internal organs, particularly cancers (~29%). However, among the 78% of disease deaths, about 10% of deaths were related to malpractice from medical treatments - "195,000 patients die in hospitals each year because of preventable medical mistakes", from the national trial law, medical malpractice statistics, Dr. George Stanislaw, 2019".

Generally speaking, genetic factors only contributes ~20% (10%-30%) to various chronic diseases, while lifestyle and metabolism cause ~80% of disease deaths of the 68% (78%-10%) chronic disease complications and cancers. The following simple arithmetic calculation can draw a conclusive fact that about 54% (0.8*0.68) of deaths caused by diseases are preventable through a better lifestyle management and metabolism improvements. Furthermore, among all of the lifestyle details, food is the utmost important category.

This article investigates the inter-relationship between food and 5 selected diseases. This study uses the author's collected data of his own food consumption and calculated risk probability of having CVD, CKD, DR, Cancers, and T2D, over a 6.5-year period from 1/1/2015 to 8/11/2021. In this study, he separates diabetes and the other 4 diseases due to the input element of carbohydrates and sugar (carbs/sugar) intake amount.

In summary, both the food quantity score and total food score (quantity plus quality) have shown extraordinarily strong correlations or inter-relationships of 68% to 85% with 4 diseases: CVD, CKD, DR, and Cancers. However, the carbs/sugar alone does not have a strong correlations (36% to 55%) with these 4 diseases. The second analysis between food and diabetes has shown that carbs/sugar alone has moderated correlations (51%-58%) with T2D (e.g., PPG, eAG, and HbA1C). If we combine carbs/sugar and post-meal walking steps (exercise) together, this food and exercise combined effect has indicated extremely strong correlations (88%-90%) with T2D.

A long and healthy life is a desirable goal for everyone. Cancers, CVD, and CKD are deadly diseases while DR could cause blindness. Lifestyle management (particularly food management) is crucial in achieving health and longevity goals. This article depicts the strong influence on risk probability of having Cancers, CVD, CKD, DR, and even T2D control combined with exercise.



Introduction

The author is a professionally trained mathematician, physicist and engineer. His view of health and medicine is similar to his past experience on designing a physical object, such as a building structure or a working machine, which he calls an "object". The object's strength or its expected lifespan is similar to the health conditions and longevity of a human being based on the following three key factors:

1. The original strength of the object's material which is similar to the genetic factors of a human body.
2. The engineering design and site construction of this object are similar to the fundamental influential causes, including lifestyle details, life-long habits, and environmental factors, on the human health. Among those external causes, if the author has to pick up one category which has the most influence above of all that is the "food".
3. The object endures different operational problems due to external forces or impacts which are similar to various diseases suffered by humans. After the object experiences external forces or impacts, we use some structural reinforcements to fix the building's damaged cracks or replace the malfunctioned part of the machine. These engineering actions are similar to the "medical treatments" doctors provide patients.

The medical treatments, including medication interventions (oral drugs or biochemical injections), necessary surgeries, or certain organ transplants are similar to the engineering repair of the damaged object.

This article emphasizes the relationship between causes and results such as symptoms of diseases. It particularly addresses the inter-relationship of 5 selected diseases: cancers, cardiovascular diseases (CVD), chronic kidney diseases (CKD), diabetic retinopathy (DR), and type 2 diabetes (T2D), where the most important cause for most diseases is "food". This food category in his study contains 25 defined elements include input data of food are collected via the developed iPhone APP. There are 5 elements for "Food Quantity": breakfast amount, lunch amount, dinner amount, amount of between-meals snacks and fruits, and the average daily food consumption amount. In addition, there are 20 selected elements for "Food Quality" (see Figure 1). The combined Food score is the average value of both food quantity score and food quality score.

In the US, there were ~2.85 million deaths in 2019 with 10% of total deaths caused by infectious diseases (2020 & 2021 would have a higher number due to the COVID epidemic), while another 12% involved accidents, injuries or suicide. The remaining 78% of deaths are due to various diseases associated with internal organs, particularly cancers (~29%). However, among the 78% of disease deaths, about 10% of deaths were related to malpractice from medical treatments - "195,000 patients die in hospitals each year because of preventable medical mistakes", from the national trial law, medical malpractice statistics, Dr. George Stanislaw, 2019".

Generally speaking, genetic factors only contributes ~20% (10%-30%) to various chronic diseases, while lifestyle and metabolism cause ~80% of disease deaths of the 68% (78%-10%) chronic disease complications and cancers. The following simple arithmetic calculation can draw a conclusive fact that about 54% (0.8*0.68) of deaths caused by diseases are preventable through a better lifestyle management and metabolism improvements. Furthermore, among all of the lifestyle details, food is the utmost important category.

This article investigates the inter-relationship between food and 5 selected diseases. This study uses the author's collected data of his own food consumption and calculated risk probability of having CVD, CKD, DR, Cancers, and T2D, over a 6.5-year period from 1/1/2015 to 8/11/2021. In this study, he separates diabetes and the other 4 diseases due to the input element of carbohydrates and sugar (carbs/sugar) intake amount.

Methods

Research method in this article

The author described how to apply his engineering science background, including mathematics, physics, and computer science to conduct his medical research on the subject of "risk probability of having Cancers, CVD, CKD, DR". He has reviewed his own past 6.5-years of collected data from 1/1/2015 through 8/11/2021 using both of his medical conditions and lifestyle details.

As a part of his medical research, he applied the acquired mechanical and structural engineering knowledge to develop several biomedical models to research three chronic diseases and their complications. They include CVD, CHD, stroke, CKD, DR, pancreatic beta cells impairment, and even risk probabilities of having cancer or dementia in order to estimate the impact on human lives.

The engineering analogy of deaths caused by disease and human expected lifespan can be explained simply by using an example of a new machine or a new bridge. If we develop a monitoring system to continuously measure, record, and analyze the external forces, material strength and damages of material of a machine or a bridge, as well as the relationship between force/stress (causes of disease such as lifestyle details) and deformation/strain (symptoms of disease such as medical conditions), we can then have a clear idea how severe the damages are and how long this machine or bridge will last which is their useful life or expected lifespan.

The author self-studied chronic diseases, metabolism, and food nutrition for 4-years from 2010 to 2013. He started his medical research work by building a mathematical metabolism model in 2014. He named his research methodology as the "GH-method: math-physical medicine (MPM approach)".

Over the past 11 years of his MPM research, he has learned that the most important factor is knowing how to apply physics principles and engineering modeling techniques to various biomedical problems. This is different from inserting your biomedical data into some existing mathematical equations extended from physical theories and engineering models. The reason for doing this is that the original mathematical equations associated with the inventors' theories or models usually come along with their original boundary conditions. This may or may not be perfectly fit into your biomedical situations directly; therefore, you must understand the scope and applicability of these physical theories and engineering models first, and then find a suitable way to apply them. In other words, by learning other people's wisdom first and then find a way to apply their wisdom to your own biomedical problem is the most practical way to solve these biomedical problems.

The author's simple numerical calculation of diseases risk for a patient is based on his knowledge and applications of physics law/concept and engineering modeling, big data analytics, and his developed mathematical metabolism model. It has depicted a possible way to extend lowering the risk probability of having diseases via an effective metabolic condition improvement and lifestyle maintenance program. This practical method has already been applied and proven effectively in the author's own case of control of his T2D and its complications without taking medications over the past 6 years.

The author hopes that this method can also be easily applied to other patients who face the risks of having certain metabolic disorder induced diseases.

GH-Method: math-physical medicine

Topology is a newer branch of mathematics which was created around 1900. It studies key properties of "spaces", such as metabolism of the human body space, which are invariant under any continuous deformation happened during the lifespan. A few key properties or characteristics are not going to change as long as the space itself is not encountering a "breaking" situation, such as operational discontinuity of organs or death as a total "broken" case. Topology optimization is a mathematical method that optimizes material layout within a given design space, for a given set of loads/forces, boundary conditions and constraints with the goal of maximizing the performance of the system. As a matter of fact, topology optimization has been applied by some engineers to obtain the best layout design and expected performance of certain automotive components. When we look at human organs and try to determine how to achieve particular predetermined health goals, we recognize that the human metabolism is also a related form of the "topology optimization". This problem can be solved by using some available mathematical programming method in combination with finite element engineering modeling method from both structural and mechanical engineering disciplines to conduct the targeted analysis in order to obtain an optimized human organ performance or human organ's biochemical response.

Based on the above learned academic knowledge and acquired professional experience, the author spent the entire year of 2014 to develop a mathematical metabolism model. This human metabolism model consists of a total of 10 categories, including 4-categories of disease conditions (body outputs, like deformation/strain) and 6-categories of lifestyle details (body inputs, like force/stress). Similar to an engineering finite element model, these 10 categories further consist of around 500 detailed elements. Finally, utilizing complicated mathematical derivations and multiple programming techniques, he was able to proceed his topological response analysis and obtained his developed 14-page long output sheets which was then used in 2014 for his software programming work. This application software development task is a rather sophisticated job that obtains an ***approximated*** estimation of human metabolism situation.

A physical analogy of this mathematical metabolism model is similar to "using a finite numbers of nails that are encircled by millions rubber bands". For example, at first, we hammer 10 nails into a piece of flat wood with an initial shape of a circle with a center in the middle of the circle, then take 3,628,800 (=10!) rubber bands to encircle all of these 10 nails, starting with 2 nails, and then 2+ nails, and finally enclosing all of these 10 nails. These ~3.6 million rubber bands represent the maximum possible relationships existing among these 10 nails. In other words, a small number of data elements of 10 would create a huge number of possible relationships to connect these 10 data elements. Some rubber bands encircle 2 nails, or 3 nails, and so on, until the last rubber band encircles all of the 10 nails together (no rubber band to encircle a single nail is allowed). Now, if we move any one of the nails outward (i.e., moving away from the center of the nail circle), then this moving action would create some internal tension (or stretch force) inside the encircled rubber band. Moving one particular nail ***"outward"*** means one of these ten metabolism categories is becoming ***"unhealthy"*** which would cause some internal stress to our body. Of course, we can also move some or all of these 10 nails outward at the same time, and with different moving scale for each nail. If we can measure and calculate the summation of all of these internal tensions which are created inside of the affected rubber bands, then this summarized tension force is equivalent to the total metabolism value of human health. The higher tension means the higher metabolism value which creates an unhealthy situation. The author uses the above-described physical scenario of moving nails and estimating tensions inside of their encircled rubber bands to explain his developed model of mathematical metabolism for human health.

At first, he developed a medical software APP on his iPhone in 2011, he then began collecting his own health data of weight and glucose since 1/1/2012. After that, he started category by category to enter his other medical conditions, e.g., blood pressure, lipid, etc. and detailed lifestyle data for the period of 2013 to 2014. By now 8/7/2021, he has already collected more than 2 million data regarding his own body health and lifestyle details. Finally, by the end of 2014, he compiled all of his available big data together and expressed them in terms of two newly defined biomedical terms: the metabolism index (MI), which is a combined daily score to show the body health situation, and ***general health status unit (GHSU), which is the 90-days moving average number to show the health trend.*** He has also identified a "break-even line or point" at 0.735 or 73.5% to separate his metabolic conditions between the healthy state (below 0.735) and unhealthy state (above 0.735).

With his collected 2+ million big data, he focused initially on weight and glucose to conduct further analysis in order to put his severe diabetes under control. This was his top priority, similar to engineers looking at a project's dynamic structural design data or cardiologists reviewing a patient's EKG chart, he adopted the traditional time-series analysis approach. He then quickly realized that he could easily obtain a different conclusion dependent upon the selected time window of his data.

One day, as he studied the history of medicine, he found an interesting story about how Dr. John Snow from the UK discovered the cholera outbreak, which spread in the Broad Street area of London in 1854. He decided to adopt this similar concept, i.e., spatial analysis, from statistics as an additional tool to analyze his big and complicated medical data. A good example of his spatial analysis applications is the close relationship between morning's body weight and morning's fasting glucose which can be identified easily via eye-checking and also proved precisely by mathematics. If he uses a spatial analysis approach and analyzed all data he collected within the entire long period of time span, he could easily see a bigger picture, such as the data's relationship and data moving trend. Sometimes, the conclusion derived from a global view using spatial analysis might not be consistent with certain local views using time series analysis from a shorter time period. Spatial analysis is powerful to provide a rather clear view of the relationship and data moving trend provided when data size is big enough.

He also applied Fourier transform to convert a time domain data into a frequency domain in order to calculate and compare associated energy between high frequency with lower amplitude glucose components versus low frequency with higher amplitude glucose components. The energy theory from mechanical engineering is frequently used by him to apply it on calculating different degrees of energy on the internal organs carried by different glucose components. He also applied the frequency domain analysis to figure out the damage on human organs due to different input waveforms, such as a glucose wave or a heartbeat wave. This is how he connected the energy theory application of mechanical engineering with the wave theory application of electronics engineering.

At times, he also utilized signal processing techniques from wave theory (electronic engineering, radio-wave communication, and geophysics) to decompose a glucose waveform into many component-based sub-waveforms in order to study the impact on glucose by different contribution components, such as food, exercise, etc.

One day in early 2020, he suddenly realized that Albert Einstein invented quantum mechanics and theory of relativity to figure out the complex relationship among planets in outer space. Likewise, inside the human body, there is an inner space that contains many inter-connected organs. It is similar to the many mutually-influenced planets in outer space. The complexity of human organs and diseases are comparable to the complexity of planets in outer space. He then decided to apply the perturbation theory (single variable with first-order to third-order polynomials only) of quantum mechanics to predict an approximate postprandial glucose (PPG) waveform before patients eat their meals. He also applied the perturbation theory's approximation method on his risk assessment of having CVD, CHD, CKD, stroke, DR, cancers, and expected health age of longevity. Remarkably, all of his analyses to date have achieved 95% to 99% of prediction accuracy.

The author has suffered many complications resulting from his obesity, diabetes, hypertension, and hyperlipidemia, including five cardiac episodes, critical kidney condition, bladder infection, diabetic foot ulcer, retinopathy, neuropathy, hypothyroidism, diabetic constipation, diabetic fungal infection, and more. By using metabolism as the foundation of his analysis, he is able to extend his research into many different but inter-related medical branches as long as the diseases share some or many overlapping root-causes. In his extended risk study of disease complications, genetic factors, and certain environmental influences were also included in his mathematical modeling.

In some of published medical papers regarding the study of identifying direct relationships among diseases, some phrases used frequently by some medical research scientists such as, ***"lacking epidemiological evidence, having incomplete biological links, or facing unclear pathophysiologies underlying of the association between disease A and disease B".***

Consequently, the author began to contemplate the meaning of this subject deeper by using his physics and engineering background. For example, various cancers (Disease A) and diabetes (Disease B) have their own separated root-causes, but the majority of the two families of disease causes are overlapping with each other. In order to identify the direct relationship between diabetes and cancers based on ***symptoms only*** is more unclear or even difficult. However, it may be easier to start with digging into their ***overlapping causes,*** e.g., lifestyle, genetics, life-long bad habits, or environmental factors, and the overall metabolism.

This situation can be illustrated using the author's engineering and physics background. For example, a steel structure can undergo three types of forces, one-dimensional (1D: tensile/compression), two-dimensional (2D: shear), or three-dimensional (3D: bulk pressure). The 1D tensile stress (stretching force) and strain (longitudinal stretched deformation) are dependent on the Young's modules, the 2D shear stress (shear force) and strain (shear deformation) are reliant on the shear modules, and the 3D stress and strain are contingent on the bulk modulus. However, these 3 Modulus of the steel material are actually the natural properties of steel material which are similar to our body health and organ strength. Let us take 1D and 2D cases to demonstrate the relationship between cancer and diabetes. If the Young's modules is equivalent to the cancers relationship between their causes and symptoms, and shear modules is similar to the diabetes relationship between its causes and symptoms, then both diseases (symptoms or deformations) are directly related to the actual causes or forces which are further dependent on the material properties of the study subject (steel or human body). The engineering material (or human body material) contains Young's modules and shear modules that is parallel to our human body as being under the influences of common causes of diseases such as genetics, life habits, lifestyle details, environmental factors, medical conditions, and overall metabolism. Therefore, we need to start with the understanding of the material (body and organs) first or the underlying causes (lifestyles, genetic, habits, environmental) instead of directly searching for the relationship between the symptoms such as tension and shear (i.e., the symptoms of cancers and symptoms of diabetes).

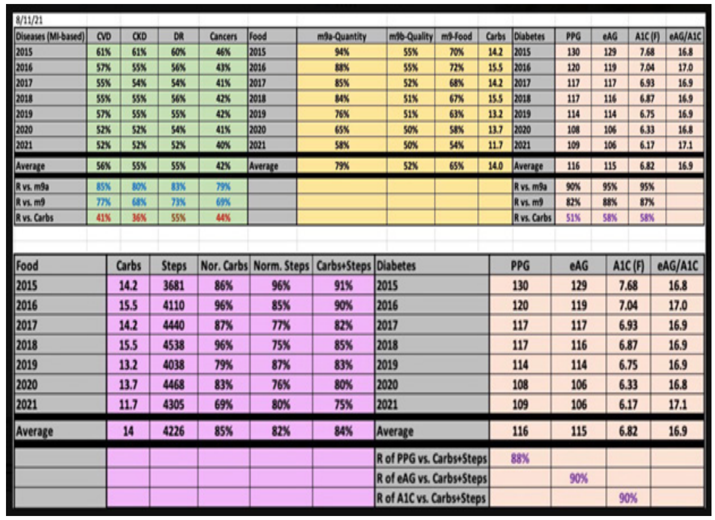
The above-mentioned information depicts how a mechanical and structural engineer, physicist, computer scientist, and mathematician who lacks formal training on both biology and chemistry, learned about deaths caused by various chronic diseases and their complications and is able to conduct all related medical research work. With all of his developed math-physical medicine research work, his final goal is to fight against different diseases in order to survive by avoiding "pre-mature" death (at least ~80% of death cases). Living a healthier and longer life is everyone's ultimate objective. This is also the driving force in dedicating his efforts on medical research beginning in 2010.

Results

Figure 1 is a copy of the screenshot of food quality from his iPhone APP. It contains 20 elements which are self-explanatory. The food quality occupies 50% of weight in calculating the food category, while the food quantity occupies the other 50% of weight.

Figure 1: 20 elements of food quality

Figure 2 illustrates the data table of both food and diseases along with their calculated correlations.



8/11/21

Diseases (MI-based)	CVD	CKD	DR	Cancers	Food	m9a-Quantity	m9b-Quality	m9-Food	Carbs	Diabetes	PPG	eAG	A1C (F)	eAG/A1C
2015	61%	61%	60%	46%	2015	94%	55%	70%	14.2	2015	130	129	7.68	16.8
2016	57%	55%	56%	43%	2016	88%	55%	72%	15.5	2016	120	119	7.04	17.0
2017	55%	54%	54%	41%	2017	85%	52%	68%	14.2	2017	117	117	6.93	16.9
2018	55%	55%	56%	42%	2018	84%	51%	67%	15.5	2018	117	116	6.87	16.9
2019	57%	55%	55%	42%	2019	76%	51%	63%	13.2	2019	114	114	6.75	16.9
2020	52%	52%	54%	41%	2020	65%	50%	58%	13.7	2020	108	106	6.33	16.8
2021	52%	52%	52%	40%	2021	58%	50%	54%	11.7	2021	109	106	6.17	17.1
Average	56%	55%	55%	42%	Average	79%	52%	65%	14.0	Average	116	115	6.82	16.9
R vs. m9a	85%	80%	83%	79%						R vs. m9a	90%	95%	95%	
R vs. m9	77%	68%	73%	69%						R vs. m9	82%	88%	87%	
R vs. Carbs	41%	36%	55%	44%						R vs. Carbs	51%	58%	58%	

Food	Carbs	Steps	Nor. Carbs	Norm. Steps	Carbs+Steps	Diabetes	PPG	eAG	A1C (F)	eAG/A1C
2015	14.2	3681	86%	96%	91%	2015	130	129	7.68	16.8
2016	15.5	4110	96%	85%	90%	2016	120	119	7.04	17.0
2017	14.2	4440	87%	77%	82%	2017	117	117	6.93	16.9
2018	15.5	4538	96%	75%	85%	2018	117	116	6.87	16.9
2019	13.2	4038	79%	87%	83%	2019	114	114	6.75	16.9
2020	13.7	4468	83%	76%	80%	2020	108	106	6.33	16.8
2021	11.7	4305	69%	80%	75%	2021	109	106	6.17	17.1
Average	14	4226	85%	82%	84%	Average	116	115	6.82	16.9
						R of PPG vs. Carbs+Steps	88%			
						R of eAG vs. Carbs+Steps		90%		
						R of A1C vs. Carbs+Steps			90%	

Figure 2: Data table of food and diseases and calculation results of correlation coefficients between food and diseases

Figure 3 depicts the total food score versus relative risk probability of having 4 metabolic disorder induced diseases, including a large portion of cancers. A general observation of this diagram regarding these 5 curves is that they are trending downward from higher numbers in 2015 to lower numbers in 2021.

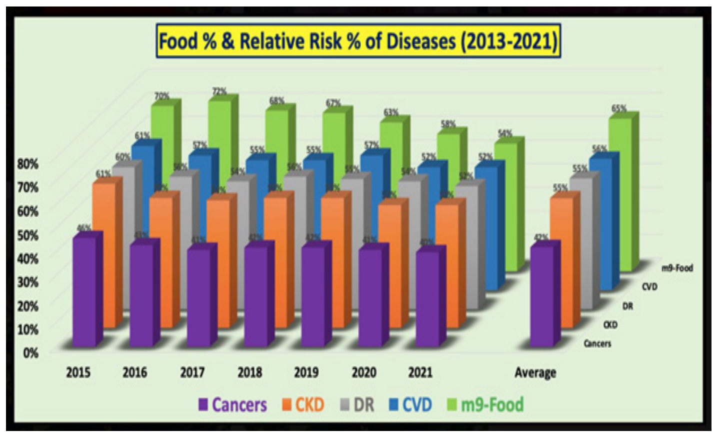


Figure 3: Food score vs. Risk Probability of having Cancers, CVD, CKD, and DR (2015-2021)

Figure 4 reveals the 12 related correlations between food (food quantity, total food score, and carbs/sugar) and diseases (Cancers, CVD, CKD, and DR). The similar wave trend of curves (i.e., bar heights) in Figure 3 already discloses the high correlations in Figure 4. However, Figure 3 merely proves the eye-ball examination results using numerical proof in Figure 4. It should also be pointed out that carbs/sugar alone has only moderate correlations (41%-55%) with these 4 diseases. This confirms that the carbs/sugar amount is especially important to diabetes control, but not important to other 4 metabolic disorders induced diseases.

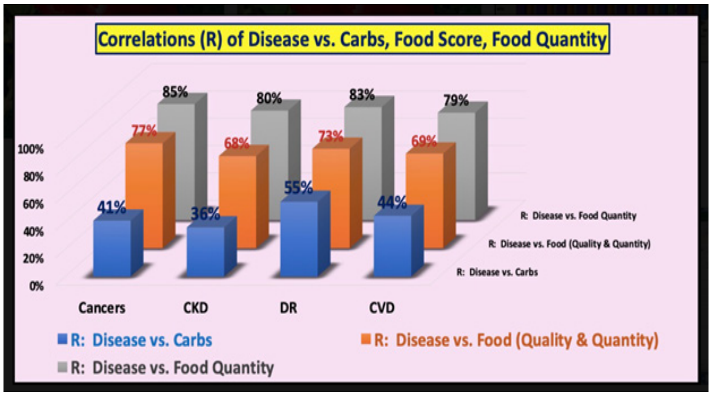


Figure 4: Correlations Between Food Quantity, Total Food Score, Carbs Versus Cancers, CVD, CKD, and DR

Figure 5 reflects 4 line-curves including PPG, eAG, A1C, and the carbs+exercise. The data table from Figure 2 shows the correlations between carbs/sugar versus T2D (PPG, eAG, A1C) are only moderate (51%-58%). This is due to the fact that carbs/sugar intake is only contributing about half to glucoses, while the other missing half is the input of exercise amount, especially post-meal exercise. The data behind Figure 5 uses the original carbs/sugar in gram and the original exercise in steps, and then utilizes 14 grams for carbs/sugar and 4,000 steps for post-meal walking as the normalization standard in order to develop the combined curve of carbs+steps.

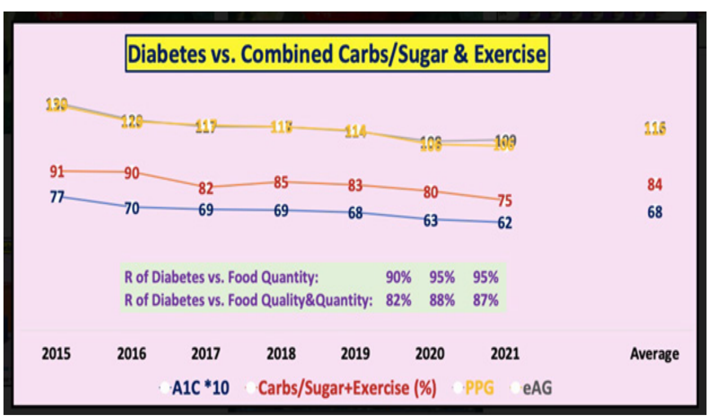


Figure 5: Carbs/sugar versus T2D (PPG, eAG, and A1C)

Figure 6 indicates the correlations between carbs versus T2D (51%-58%) and carbs+steps versus T2D (88%-90%). This diagram proves the importance of both carbs/sugar intake control and persistent post-meal exercise on T2D control.

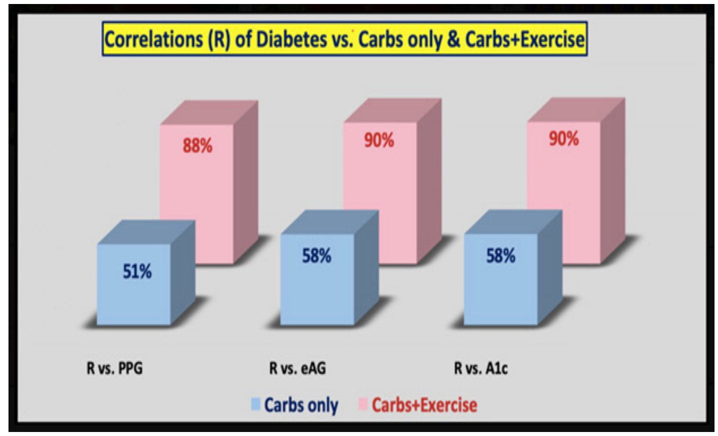


Figure 6: Correlations Between Carbs/Sugar Only and Carbs/Sugar Plus Exercise Versus T2D (PPG, eAG, and A1C)

Conclusions

In summary, both the food quantity score and total food score (quantity plus quality) have shown extraordinarily strong correlations or inter-relationships of 68% to 85% with 4 diseases: CVD, CKD, DR, and Cancers. However, the carbs/sugar alone does not have a strong correlations (36% to 55%) with these 4 diseases. The second analysis between food and diabetes has shown that carbs/sugar alone has moderated correlations (51%-58%) with T2D (e.g., PPG, eAG, and HbA1C). If we combine carbs/sugar and post-meal walking steps (exercise) together, this food and exercise combined effect has indicated extremely strong correlations (88%-90%) with T2D.

A long and healthy life is a desirable goal for everyone. Cancers, CVD, and CKD are deadly diseases while DR could cause blindness. Lifestyle management (particularly food management) is crucial in achieving health and longevity goals. This article depicts the strong influence on risk probability of having Cancers, CVD, CKD, DR, and even T2D control combined with exercise.

References

For editing purposes, the majority of the references in this paper, which are self-references, have been removed for this article. Only references from other authors' published sources remain. The bibliography of the author's original self-references can be viewed at www.eclairemd.com.