

# DÁIL ÉIREANN

---

## AN COMHCHOISTE UM SHLÁINTE

## JOINT COMMITTEE ON HEALTH

---

*Dé Máirt, 23 Feabhra 2021*

*Tuesday, 23 February 2021*

---

Tháinig an Comhchoiste le chéile ag 10 a.m.

The Joint Committee met at 10 a.m.

---

Comhaltaí a bhí i láthair/Members present:

Teachtaí Dála/Deputies	Seanadóirí/Senators
David Cullinane,	Frances Black,
Bernard J. Durkan,	Martin Conway,
Gino Kenny,	Seán Kyne.
Róisín Shortall.	

Teachta/Deputy Seán Crowe sa Chathaoir/in the Chair.

## **Business of Joint Committee**

**Chairman:** Good morning. Apologies have been received from Deputies Colm Burke and Neasa Hourigan. We have one piece of housekeeping before I bring in the witnesses. Can I take it that the draft minutes of the previous public joint committee meeting of Tuesday, 16 February 2021, are agreed? Agreed.

### **Vitamin D and Covid-19: Covit-D Consortium**

**Chairman:** I welcome the witnesses, who are here to give a briefing on the emerging evidence on the role of vitamin D in reducing the severity of Covid-19 and as a measure to improve general public health. From the Covit-D Consortium I welcome Professor Rose Anne Kenny, Professor James Bernard Walsh, Dr. John Faul, Dr. Martin Healy and Dr. Daniel McCartney.

Before we hear the opening statements, I point out to the witnesses that there is uncertainty as to whether parliamentary privilege applies to evidence given from a location outside the parliamentary precincts of Leinster House. Therefore, if witnesses are directed by me to cease giving evidence in relation to a particular matter, they must respect that direction.

I call Dr. McCartney to make his opening remarks.

**Dr. Daniel McCartney:** I am grateful for the opportunity to present to the committee today. I am joined online by my colleagues, Professor Rose Anne Kenny, Professor J.B. Walsh, Dr. John Faul and Dr. Martin Healy.

There is now an extensive body of international research showing the protective role of vitamin D against Covid-19 and supporting the need for population supplementation at higher doses than those currently recommended. For example, very large background studies pooling data from dozens of individual trials have described an approximately 10% reduction in risk of respiratory infection among people taking vitamin D supplements, and a more than 50% reduction in risk among those with low vitamin D levels to begin with, especially if taking supplements daily. Therefore, there is very robust evidence that vitamin D protects against respiratory infections in general. That is not in question.

Since May 2020, geographic studies have shown that Covid-19 incidence and mortality are higher in countries that are far away from the equator and in countries with confirmed low vitamin D status. Furthermore, the population groups who are most likely to be vitamin D deficient are the same groups who have suffered the worst effects of Covid-19. These include older adults, those from black, Asian and minority ethnic, BAME, communities and those who are obese or who have pre-existing diseases, such as diabetes or high blood pressure. The unifying characteristic of these different groups is that they are all much more likely to be vitamin D deficient. It is also clear that the pro-inflammatory blood profiles seen in vitamin D deficiency foretell the aggressive, overwhelming so-called cytokine storm that has claimed the lives of so many Covid-19 patients.

Long before we had any data showing a direct relationship between low vitamin D levels and Covid-19 incidence and severity, we already had strong evidence to support the likelihood of such a relationship. From May 2020, data showing a direct relationship between low vitamin D status and increased risk of SARS-CoV-2 infection, severe disease and death began to

emerge. These studies included work by Dr. Faul in Connolly Hospital, Blanchardstown, which clearly showed much higher ICU admission rates in patients with low vitamin D levels.

Are these relationships causal? There are now several studies published showing lower rates of ICU admission, ventilation and death in those given vitamin D during their admission. There is also an unpublished public health initiative in Andalucia, Spain, which has demonstrated a remarkable reduction in Covid-19 mortality since vitamin D supplementation of vulnerable older adults started there in mid-November. Yet, despite the now dozens of positive studies including tens of thousands of participants, there has been no policy change in Ireland to advance what we believe to be an extremely low risk, readily implemented, cheap and potentially highly effective intervention to mitigate this public health crisis. While some have called for randomised, placebo-controlled trials to prove definitively the relationship between vitamin D supplementation and reduced risk, these are now ethically untenable, they are often imprecise and they are wholly impractical in the current crisis given the time required to execute them properly. They are also unnecessary. One need only think of the spectacular success of the workplace smoking ban to realise that not every effective public health intervention requires a placebo-controlled RCT behind it. As Dr. Mike Ryan, executive director of WHO stated early in the pandemic:

Be fast, have no regrets. You must be the first mover. The virus will always get you if you don't move quickly. If you need to be right before you move, you will never win. Perfection is the enemy of the good when it comes to emergency management. Speed trumps perfection.

My colleagues, who the committee will hear from today, are not just the top clinicians in the country, they are people of international stature in their specialist fields. Just as importantly, though, they are leaders who have had the integrity, the moral courage and the ethical compass to pursue this issue and to advocate for policy change in this area which will protect the Irish public. They have weighed the pros and cons of changing current policy on vitamin D supplementation and they are in unanimous agreement that the benefits of a new policy will far outweigh the very minor costs.

We are very privileged to share with the committee today this information that has the potential to save many lives over the coming months, but we also must recognise that we are all standing in a moment. As domain experts, we can provide the committee with the information and the context, but the political decisions and recommendations which flow from today's meeting must be the right ones, and the policy actions into which they translate must be delivered swiftly and decisively to alter the trajectory of this pandemic and to save lives. The imperative to act quickly and courageously has never been more profound nor the rewards greater. What we are asking of the committee today is leadership, the leadership required to enhance vitamin D policy as a central element of our living with Covid-19 strategy, and to steer us a better course out of this crisis.

**Chairman:** Thank you. As members are attending virtually from their offices and, therefore, cannot see the clock to monitor their speaking time, I will try to advise them when they have a minute remaining. I ask them to stick to their time allocations to facilitate all members' participation in the meeting. It is a difficult meeting to manage so members should bear with me if I cut across people who are speaking. Our first questioner this morning is Deputy Durkan.

**Deputy Bernard J. Durkan:** I welcome our guests and thank them for attending. I have several questions. How does one know the use of vitamin D is optimal for a particular individual, if somebody was to ask me that tomorrow morning? Is there a possible downside?

SARS-CoV-2 infection was referred to, so could we have more information on that? With regard to the condition known as Guillain-Barré syndrome, where the immune system attacks the nervous system, would a supplementation of the immune system lead to a greater chance of that condition occurring? I happen to know of at least five people who have suffered from that condition in the past two years. It is supposed to be a very rare disease, but as I know of maybe five or six people, it is not as rare as was thought. Those are my opening questions.

**Chairman:** Who wishes to answer?

**Dr. Daniel McCartney:** In respect of the first question, vitamin D supplements are optimal. In respect of neurological disease, there is much evidence that suggests there is an advantage in optimising vitamin D status. We have data from geographic studies, laboratory studies and observational clinical studies where we look at people who have SARS-CoV-2 infection and evaluate their clinical course. Latterly, we also have information coming from intervention trials with vitamin D supplementation so there is much evidence there that suggests that at least in the context of immunological problems that could predispose somebody to worse infection, vitamin D confers an advantage. Is there is a down side? I will bring Professor Kenny in on this. There are certainly situations where one needs to be careful with vitamin D but for most people, this is extremely safe. I will bring Professor Kenny in to talk more about that.

**Professor Rose Anne Kenny:** I thank the Deputy for the opportunity to respond. In respect of his first question, there are no symptoms of deficiency as such, unless the vitamin D deficiency is very low, so the Deputy will not know whether or not he is deficient as I speak to him now and I certainly do not know by looking at him. However, in the TILDA study, it was found that 60% of middle-aged adults and older persons in Ireland have insufficient vitamin D in winter.

There is no downside to taking vitamin D up to levels of 4,000 international units. Our request and recommendation is for 800 to 1,000 international units so that is the next thing. It has not been reported that Guillain-Barré syndrome is a side effect of taking vitamin D. Whether or not Guillain-Barré syndrome is associated with severe deficiencies has not been reported to my knowledge. Immunity is certainly much lower generally speaking if someone has insufficiency or deficiency of vitamin D. There are immune underlying causes of Guillain-Barré syndrome likely.

**Dr. Daniel McCartney:** We have responses from Professor Walsh and Dr. Faul.

**Professor James Bernard Walsh:** I would add to what Professor Kenny said. The safety of vitamin D is well recognised. She said that we recommend 800 to 1,000 international units. That is what we give to our bone patients but it is recognised by the Institute of Medicine that safe levels can be up to 4,000 per day. This is really to emphasise what Professor Kenny said. In addition to the recent longitudinal study with which Professor Kenny was involved and which she quoted to the committee, we also have the study involving 36,500 people in the Dublin metropolitan area published last August that showed that 70% of people living in the Dublin metropolitan area, Kildare and Wicklow are insufficient or deficient in vitamin D during the winter, which is a significant percentage, and 30% are insufficient or deficient all year round. When it comes to people in the Indian community at whom we have looked, only 17% of them are sufficient and that is the same throughout. They do not change in summer or winter. That is very important.

We know also that some people who develop Covid-19 get neurological problems. We have seen this in young children who have problems walking. Guillain-Barré syndrome was

mentioned. There are neuropathies and, as we know, Guillain-Barré syndrome is a post-viral-type neuropathy so there are main neuropathies. This is not to say we have strong evidence that vitamin D affects that but we know the severity of disease with people who get Covid is more severe among those with very low levels of vitamin D. It is important they have vitamin D normalised a long time before they get Covid. One does not shut the stable door after the horse has bolted. We are still waiting for the evidence that this may be of value but we know that people with the severest form of the disease have the lowest levels of vitamin D. We have seen this in the BAME community.

**Dr. Daniel McCartney:** Dr. Faul would like to comment on this as well.

**Dr. John Faul:** I thank the Deputy for an astute question. The effects of vitamin D are essential. It is a vitamin, which is a vital amine. It is required for someone to be alive. The original studies, which we cannot do in humans, were done in animals at the turn of the century and involved withdrawing animals from sunlight and nutrient vitamin D. One of the problems with human studies is that even if we tell people not to take vitamin D supplements, if they go out in the sunshine, they will get vitamin D. Dr. McCartney said that what is done in animal studies would be unethical in human studies. If one withdrew animals from sunshine and gave them a particular diet such as that the famous single-grain experiment, which involved giving animals either corn, oats or wheat, they would not survive. The animals who did the best were those fed corn. It was worked out by scientists at the time - Steenbock *et al* in Wisconsin, details of which I can share with the committee - that it involved ultraviolet radiation of the food itself. Even irradiating the food with ultraviolet light let the animals survive and thrive. If one did not do this, the animals would be infertile and would not thrive.

The effects of vitamin D are thought to be beneficial in humans. In fact with regard to the entire cereals industry in the US involving companies like Kellogg, Quaker Oats bought the patent for irradiating cereals so it could say there was vitamin D supplementation of its cereals. As the members are aware, Quaker Oats is a well-known cereal manufacturer in the US. It was based on that scientific knowledge that vitamin D is good for us and people should take it on a daily basis.

Regarding the question about Guillain-Barré syndrome, I agree with my colleagues that we do not have enough data on that. What we can tell the Deputy is that in the case of animals, on whom we can do experiments, animals that are vitamin D-deficient or vitamin D knockout mice have enhanced autoimmune encephalitis, an immune response that leads to a form of neurologic disease, which is the classic model. We would guess from the models of animals that it would be worse if one was vitamin D-deficient. Obviously, Guillain-Barré syndrome is uncommon and is very difficult to predict but that is what we would say.

We would also say that multiple sclerosis is similar to vitamin D deficiency and has been associated with it. I can send the members papers on this. If someone is vitamin D deficient, he or she is much more likely to get multiple sclerosis, which is a very similar type of neurologic disease to Guillain-Barré syndrome. I know it is not quite the same syndrome but it is a very similar type of neurologic disease that is affected by the immune system. I do not think fears of Guillain-Barré syndrome should push us off giving vitamin D supplementation to our patients.

**Dr. Daniel McCartney:** I wish to comment on one thing Professor Walsh said. We have identified a number of groups that are particularly susceptible to vitamin D deficiency across the population. This is really a whole-of-society problem and requires a whole population response even though we know that vitamin D deficiency is more prevalent in our older adults, BAME

communities and certain other communities. Even in young people, it is extremely prevalent. About 50% of our young people aged 18 to 39 have low vitamin D levels at this time of year. It is across the population, which is why it requires a central intervention from the statutory health authorities.

**Deputy David Cullinane:** I welcome all of the witnesses. I have a couple of questions for Dr. McCartney. If it is possible, I ask him to answer them first. I appreciate others have different fields of expertise, but if everybody answers the first questions that are put my ten minutes will be up. I want to understand where we go from here and what the HSE needs to do, which is the most important part of this meeting from my perspective.

I want to get a sense of the issues. In his opening statement, Dr. McCartney said there is an extensive body of international research showing the protective role of vitamin D. He then discussed geographic studies which have shown that Covid-19 incidence and mortality are higher in countries far from the equator and in countries with confirmed low vitamin D status. He went on to say that in May 2020 data emerged showing a direct relationship between low vitamin D and an increased risk of SARS-CoV-2 infection, severe disease and death. Can he give us some more information on where that data is coming from?

**Dr. Daniel McCartney:** There are quite large studies from the USA and Israel, in particular, on the risk of SARS-CoV-2 infection. A study of 500 patients from Chicago, 71 of whom tested positive for Covid-19, revealed that a person who was deficient in vitamin D was 77% more likely to be SARS-CoV-2 positive. A larger study from the US of 192,000 people-----

**Deputy David Cullinane:** I know the countries where the statistics come from. What is the source of the information? Are they academic studies? Are they coming from research and development facilities? Are they coming from universities? What is the background to the studies?

**Dr. Daniel McCartney:** They are academic studies. Those involved are medical academics. For example, the lead researcher on the very large study I mentioned in the US is Dr. Michael Holick, who is attached to Boston University. He is a medic. The other study I noted was carried out by colleagues in Chicago, which was a clinical study carried out by university academics with medical facilities. That is where the studies have been conducted.

**Deputy David Cullinane:** I am conscious that people are very frustrated at the moment about the fact we are still in this situation almost a year on from the onset of Covid. Obviously, it is a difficult time for everybody. When claims are made that we can reduce mortality – I am not saying those claims are wrong - they have to be peer reviewed and evidence-based. Dr. McCartney said there is also an unpublished public health initiative in Spain which demonstrated a remarkable reduction in Covid-19 mortality since vitamin D supplementation of vulnerable older adults.

**Dr. Daniel McCartney:** That is right.

**Deputy David Cullinane:** What is the source of that study?

**Dr. Daniel McCartney:** The public health authorities took evidence from a smaller study in Córdoba, Spain, which has been published. Córdoba is in Andalusia. It was a small study of 76 Covid-19 patients. The patients were divided in a 2:1 ratio, such that 50 of the 76 patients coming into hospital received vitamin D in an activated form, that is, a reasonably high dose quite early in their admission on days 1, 3 and 7. The other 26 patients received standard care

but no vitamin D. The study followed the patients over the course of their admission. Of the 50 who received vitamin D, just one person, or 2% ended up in ICU. Of the 26 who did not receive vitamin D, 13 ended up in ICU and, unfortunately, two of them died. There was a huge difference in terms of ICU admission, which translated to a 30 to 35-fold difference statistically in the likelihood of ending up in ICU. The public health-----

**Deputy David Cullinane:** I have a follow-on question.

**Dr. Daniel McCartney:** Yes.

**Deputy David Cullinane:** Dr. McCartney said in his opening statement that he believes that there is an extremely low-risk, readily implemented, cheap and potentially highly effective intervention to mitigate this public health crisis.

**Dr. Daniel McCartney:** Yes.

**Deputy David Cullinane:** For the purposes of clarity, I am assuming he would argue that it would supplement all of the other measures. It is not a substitute for all of the other public health measures, such as the vaccine roll-out and so on. This would be an additional measure. When people are at the end of their tether and in a difficult space, we want every and any option to be on the table. I certainly would. Dr. McCartney is arguing that this would be an additional measure. Would that be a fair comment?

**Dr. Daniel McCartney:** That is a good analysis. We want to be absolutely clear that we are recommending vitamin D supplementation in addition to the other health messages, such as social distancing and vaccines. It is an additional intervention that may yield a benefit.

**Deputy David Cullinane:** I want to discuss recommendations, which are the important part. In his opening statement, Dr. McCartney said:

... the political decisions and recommendations which flow from today's meeting must be the right ones, and the policy actions into which they translate must be delivered swiftly and decisively to alter the trajectory of this pandemic and to save lives.

I do not see many recommendations in his opening statement. I presume he wants to flesh those out in the context of this conversation. He says he wants to see action, interventions and solutions, so I invite him to use the remainder of my time to spell out, as if he was talking directly to the HSE or the Minister for Health, the immediate courses of action he thinks need to be taken by our public health specialists, the HSE and the Minister. What policy actions does he recommend?

**Dr. Daniel McCartney:** The first and most important action has been mentioned by Professor Kenny. We think that a recommendation and explicit guideline for adults in the Irish population to supplement 20 to 25 mcg per day, or 800 to 1,000 units per day, is absolutely essential. We also feel that higher supplementation may be required under medical supervision in at-risk groups, such as people from the BAME communities, people who are overweight or obese, which comprises 60% of the adult population, and older people or people in nursing homes, in particular, who have notably lower vitamin D levels than the rest of the population.

The other question that may arise is whether we give vitamin D free, as is happening in the UK, to specific at-risk groups. Do we supplement people in nursing homes, prisons or other long-term care institutions where their vitamin D levels are likely to be compromised? There

are a number of discrete populations which can be supplemented, such as, for example, people in nursing homes. We know that half of the mortality observed in Ireland in regard to the Covid-19 pandemic has occurred in these settings. We think that is a no-brainer.

**Deputy David Cullinane:** What guidelines are in place for patients in public hospitals? I would imagine that would be an obvious place to start.

**Dr. Daniel McCartney:** Absolutely. The question of whether to supplement vitamin D for hospital patients is absolutely valid. It would be a very useful intervention. They are another group for which there is data to suggest they have lower vitamin D levels than the rest of the population. For people coming into hospital with Covid-19, I would imagine that might be a beneficial thing if they can convert the vitamin D into its active form quickly enough.

There are other groups which are susceptible. By definition, a proportion of those attending for Covid-19 testing will be Covid-19 positive and in the early stages of the disease. It would be very useful to supplement them and provide them with free vitamin D when they arrive at a testing centre.

There are other groups. We do not know what the vitamin D status is for people in meat processing plants, for example. We might speculate that their vitamin D levels are low, but it is a high-risk environment. They might be another group that we could consider. Very susceptible groups should be under consideration. It is really important that nursing homes implement this advice and at sufficient levels. As I have said, 20 to 25 mcg per day or 800 to 1,000 units per day might be sufficient for most adults, but in nursing homes people may require higher doses in order to reach the minimum threshold for adequacy under medical supervision.

**Professor James Bernard Walsh:** To respond to Deputy Cullinane's question, the Department of Health recently mentioned supplementation of 600 international units daily. We are saying between 800 international units and 1,000 international units daily so there is not much difference. The other reason is that our emphasis is slightly different. A level of 30 nmol per l is a blood level for deficiency and 50 nmol per l is what we normally take as a sufficient level. At 30 nmol per l, there is still a level of secondary hypoparathyroid and the body is struggling to raise the level. We have 7,000 people attending our bone health clinic annually. We aim to get everyone up to 50 nmol per l or even slightly higher because as people get older, we like them to be at a level of between 60 nmol per l and 70 nmol per l because there is a slight reduction in falls as well. The Department recommends 600 international units daily to bring a person up to a level of 30 nmol per l. What we are saying is take between 800 international units and 1,000 international units. Dr. McCartney spoke of how for 800 international units one might see 20 mcg and for 1,000 international units one will see 25 mcg. The are written in two ways but we should think of units because they are very straightforward and that is how clinicians think. Nutritionists often think in milligrams but both measurements are often printed on bottle labels. Between 800 international units and 1,000 international units daily is simple. As Professor Kenny says, there is good evidence showing that people go up to 4,000 international units per day. We do not come near that. Having said that, I take 2,000 international units a day and I do not apologise for that.

Fortified milk is one source. Taking a half litre of super milk provides 400 international units in a day. Cereals are also fortified. Other than fortified milk and cereals, there is very little food available that provides vitamin D. Wild salmon is a source because they feed on plankton but farmed salmon do not get that opportunity and have only one-quarter of the amount of vitamin D that wild salmon have. That was the other source of vitamin D mentioned. The



limited number of food sources of vitamin D is the reason people are vitamin D deficient. It is a problem for young people working in factories and hospitals. Paradoxically, the study found a higher level of deficiency in the 36,500 younger people than in many of the older people. We can also consider the potential level of deficiency that has arisen in recent times, with people now indoors, whether for work reasons or in environments such as nursing homes. The study we published recently covered a five-year period. It showed total consistency every year, with levels increasing in summer, although there was still a level of insufficiency or deficiency of 30%, and deficiency of 70% in winter. It is a real epidemic. We have observed the highest incidence of deficiency and insufficiency in the black, Asian and minority ethnic, BAME, communities and seen how they have been so badly struck down with Covid. These are the kinds of issues that worry us and that is why we are here today. We are saying this is a simple solution. It is just giving a bit of sunshine in winter when we do not have any.

Incidentally, vitamin D supplementation is totally safe. Of the 36,500 people in our study, only 21 patients had a level over 250 nmol per l and all of them had normal calcium. No one had any side effects. As regards safety, it is very rare to get high levels unless people are taking, say, 5,000 international units or 7,000 international units daily. It is very rare to come across that. People do not do that; they are sensible.

**Dr. Daniel McCartney:** If I may also reply to Deputy Cullinane, the other group that could really benefit from vitamin D supplementation is our front-line healthcare workers. There are several reasons for that. First, there is data to show they have lower levels of vitamin D than the rest of the population. Second, they will comply with the recommendations because, being healthcare workers, they see the value of doing that. Third, they have a very high occupational risk through their contact with people who have Covid-19 infection. For all those reasons, we view front-line healthcare professionals as a particularly useful group to supplement with free vitamin D.

**Deputy Róisín Shortall:** I welcome the witnesses. I had some IT problems at the beginning of the meeting so I apologise in advance if any of the points I raise have been covered.

I am concerned that there is no clear advice and no recommendations from NPHEt on vitamin D supplementation. I have tabled parliamentary questions on this in recent months, most recently a couple of weeks ago. The Minister told me that the existing guidance on vitamin D, which was updated in November, advises adults over 65 years to take 15 g per day for bone and muscle health. I was disappointed that the Minister for Health did not inform me of any advice in relation to Covid and the role of vitamin D in supporting a strong immune system. The reply went on to say that NPHEt had considered this matter in January and agreed that efforts should be made to increase awareness of existing guidance and that adults spending increased time indoors, etc., are also recommended to take a vitamin D supplement. The Minister is saying that a small amount of vitamin D supplementation is recommended for bone health and NPHEt is repeating the advice and saying the recommendations for vitamin D are being incorporated into wider messaging on Covid. I have not heard that wider messaging from NPHEt - I do not know if others have - but it is really important that we get that messaging very clear. What engagement, if any, has the group had with NPHEt? This issue needs to be pursued actively by the committee. We have seen how NPHEt, while it is doing great work, can be a bit behind the curve. It was certainly behind the curve on face masks and ventilation and it seems that is also the case with regard to the role of vitamin D. That is a matter the committee will take up and pursue with NPHEt.

Is there a country that the group would hold up as the best model in relation to the impor-

tance it attaches to vitamin D in the context of Covid specifically? Is there a difference between taking vitamin D fortified foods and taking supplements? Which would the witnesses recommend?

On nursing homes, it seems there is a perfect opportunity to ensure that cohort of older and vulnerable people are taking the recommended amount by way of supplements. What is happening with regard to nursing homes and what engagement have the witnesses had with, say, Nursing Homes Ireland or the sector generally?

**Dr. Daniel McCartney:** We have not had any formal interaction with NPHE, although we know there are people on the team who are conversant with and understand the area of vitamin D. That is well worth pursuing to see if we can get better interaction there, particularly on messaging. While direct provision of vitamin D among the population might happen in due course, these supplements are very cheap and readily available. If the public get a clear message that they should be supplementing at X dose in the current context, they would follow up on that.

I will talk a little about Finland. Certainly they have done very well on food fortification and supplementation. We have seen the effect of this in terms of population with low vitamin D levels. We know Finland has got many other things right in terms of public health policies and health protection. I do not think it is any coincidence that Finland has shown not just the lowest mortality rates for Covid-19 throughout Europe but also some of the lowest incidence rates. They are quite considerably lower than most other countries. This is a country to follow if we can but we are some way off food fortification. It is not something that will be done this month or this year as it is something that takes a long time to do, so supplementation is the answer. This goes into the next question on whether fortification or supplementation is required. At current levels of fortification, which Professor Walsh spoke about in answering the previous question, we cannot reach sufficient levels of vitamin D intake to reach optimum blood levels for immune health.

**Professor Rose Anne Kenny:** I thank Deputy Shortall for her question. The bottom line is that it would be very valuable in the context of today's discussions if NPHE did more than recommend raising awareness with respect to vitamin D and if there was a much more secure recommendation along the lines we have been discussing with respect to vitamin D. Individuals in NPHE are aware of the value of vitamin D and the science behind it but we have heard nothing consistently solid from NPHE in terms of a public statement with respect to this. To give committee members an idea of how difficult it is to get sufficient vitamin D from foods, there was one Norwegian study where participants ate salmon for five days a week for a considerable period and despite this were unable to reach the sufficient levels we are discussing this morning, which is 50 nanomols per litre and above. It is very difficult to get it from food alone. We do not get it in Ireland from sunshine at this time of the year or, indeed, during most of spring and some of autumn. This message needs to get out there. I say this because I have heard scientists speaking on radio saying there is no need to supplement because people get sufficient from food and sunshine in Ireland. This is very incorrect and it needs to be said.

Some people ask whether we should be measuring vitamin D levels in everybody and then we would know. Given the high levels of insufficiency in Dublin, as we speak, at 70%, and 60% in the country generally, it is not practical in the midst of a pandemic.

**Professor James Bernard Walsh:** I thank Deputy Shortall for her support. She has been tremendous. With regard to food fortification, I want to add to what I said earlier and to what Professor Kenny said. I mentioned the only two foods that show some degree of fortification.

These are fortified milk and cereals. With regard to ordinary milk, cows are no different from humans and do not get much sunshine either in winter. It takes 40 L of ordinary milk to equal 1 L of super milk so there is a significant degree of fortification in it. Half a litre of super milk has 400 units and there are also cereals that will bring up people's levels. If children take fortified milk in the morning, they will get some supplementation but it takes a long time to build up. It is not an insignificant amount, as people can imagine, but other than this there is not really much fortification. Most farmed fish will not get much vitamin D either. This is very important.

We have all been in communication individually with individual members of NPHE, almost all of whom we know quite well. They know of our concerns. What they say is we must wait for the randomised controlled studies of the intervention of vitamin D but the trouble with this is we would have to give a large population enough vitamin D for a year and have another controlled population not being given vitamin D. It would be like giving one group parachutes and not giving parachutes to the other group. This is what we are speaking about. We are not speaking about something that will do harm. It is something that has been proven to be effective. The only reason we do not have sufficient levels is because of the fact we live here. With regard to fortified food, the US and other places have reduced incidence of severe rickets. I still get people coming in with severe bone disease and osteomalacia in the Irish culture. This is the reality. There is a huge instance of deficiency and insufficiency in the Irish community.

**Dr. John Faul:** I thank Deputy Shortall for her support and her good questions. Very briefly, partly the problem with Covid is that it is new. All of this did not exist two years ago. We are all learning as we go along. Many of the recommendations that NPHE might have made last November are changing all the time. I hope that as the science catches up with the information that is out there we will know more and more. We are beginning to learn that more supplementation is better. To back up what my colleagues said, because of the lockdown we have even less sun exposure. None of our patients with respiratory illnesses are going on sunny holidays, which are good for them. They are in lockdown and they cannot get vitamin D from the sun. For this reason alone we should be increasing the supplementation.

**Deputy Gino Kenny:** I thank the witnesses for their contributions. It is a fascinating discussion. It seems that vitamin D is the new vitamin C in some ways. It all points towards us all taking it. Is there a link or are there discussion papers on vitamin D deficiency and depression among those who suffer from seasonal affective disorder? The vast majority of the prison population in Ireland and other countries are men and the vast majority do not get any daylight as such. Has there been a study on deficiency among this population? I ask the witnesses to comment on this. What do the witnesses say with regard to general recommendations on vitamin D? Should everybody take it? Could it be prescribed in the same way as folic acid is to pregnant women? Could we generalise prescribing vitamin D? What do the witnesses recommend to the Government with regard to vitamin D? For instance, the VAT could be removed from vitamin D in particular. A country such as Iceland gets very little daylight at certain times of the year. How does it counteract deficiency? If I get this right, vitamin D is sunshine and light. People who live in Mediterranean countries have a better climate and there is much more sunlight and warmth. Is there a correlation between Covid in these areas and deficiency in vitamin D?

**Dr. Daniel McCartney:** I will answer some of the Deputy questions in reverse order. Regarding the general recommendations, we would like a recommendation for 800 to 1,000 units for all adults in Ireland with the potential for higher doses in specifically vulnerable patients, that is, older people, people who are carrying extra weight or who are obese or overweight and

people who have darker skin. There should also be direct provision of vitamin D supplementation to healthcare workers, the institutionalised elderly and our communities if possible, with nursing homes a priority.

The Deputy asked about countries that do things differently. There is a geographic difference in vitamin D status. We see it. Generally, vitamin D status is worse the further away one gets from the equator. There are exceptions, though. For example, in Italy and Spain we see much poorer vitamin D status than one would expect because people avoid the sun. They go in away from the sun during the daytime and their levels are lower for that reason. We also see much higher levels in some Scandinavian countries because their governments have been proactive in putting in place robust food fortification programmes and very well-communicated messaging on vitamin D supplementation, so they are getting it right. Finland's population has very good blood vitamin D levels and very low levels of infection and mortality from Covid-19. Norway and Sweden are also doing well on food fortification.

The Deputy asked about the prison population. I would absolutely put that population in among the vulnerable people who are much more likely to be vitamin D-deficient. The UK has said it will provide free vitamin D supplementation to the prison population there over the winter months this year.

I will hand over to Dr. Faul to respond to the Deputy's question about depression and seasonal affective disorder as they relate to vitamin D. I see Professor Kenny wants to come in on that as well. Perhaps Professor Kenny would go first, actually.

**Professor Rose Anne Kenny:** The question is timely because a couple of weeks ago we published a paper from the TILDA data set showing that people over 50 years of age in Ireland are 75% more likely to experience depression if their vitamin D levels are low. Those are just our Irish data - there are other studies - but that is very pertinent. I will leave it at that because others would like to speak.

**Dr. John Faul:** I confirm what Dr. McCartney and Professor Kenny said. There is a trick with latitude. I worked in Palo Alto, California, for a long time, which, I can tell the committee, is very sunny. Many people there, particularly those who work long hours indoors, are vitamin D-deficient merely because it is so sunny that they stay out of the sun all the time. We have seen this in the Covid pandemic, with ordinary workers in China and factory workers in Ireland and across Europe indoors all the time, not getting any sun exposure and not taking supplements because this is the economic group that is, unfortunately, hit hardest by this kind of pandemic.

I support what Professor Kenny said about depression.

As for the prisons, the Deputy talked about studies, but I would not recommend doing a formal study of prison inmates. I think that would be unfair and possibly unethical, but giving vitamin D supplementation to help them would be very worthwhile.

**Chairman:** We have come to the end of Deputy Gino Kenny's slot.

**Deputy Gino Kenny:** I think Dr. Healy wanted to come in.

**Chairman:** Okay, one more response.

**Dr. Martin Healy:** Referring to the question about Iceland, it seems counter-intuitive that they do not have any sun as such during winter but their vitamin D levels are quite good. That

is just down to their diet. They eat predominantly fish, seal meat and so on, which has high concentrations of vitamin D. That is really the reason their vitamin D levels are okay. It is diet-related, not sun-related.

**Deputy Gino Kenny:** I thank Dr. Healy. That is very interesting.

**Senator Seán Kyne:** I welcome the witnesses and thank them for their presentations and for a very informative debate. Based on the publicity in recent months, I started taking vitamin D at home recently. I have been taking Seven Seas capsules for many years as well as vitamin C so I hope I will be immune to all the different conditions. I can afford those things, thankfully. There are many more disadvantaged communities where families cannot afford supplements and perhaps would not have the level of disposable income to be conscious of these things. Therefore, any actions that could be taken for these communities would be important. Would that be worth investing in for the sake of the health of those who cannot buy supplements? I also have high cholesterol and I take tablets for that, as do many people. When the doctor takes my bloods during regular check-ups, I often get results relating to liver function and so on. Are vitamin D levels routinely taken by GPs for any age cohort? If not, should they be? Is it easy to do so? Is it easy to get a test analysed?

Secondly, Covid can impact the lungs and breathing. Does vitamin D have any other positive roles in other conditions in keeping people fighting fit? For example, we have not had the winter flu this year, thankfully. Obviously, that is related to Covid and all that has gone on in that regard. Could vitamin D be beneficial in keeping people fit enough to fight a winter flu? Is there any evidence for that? We are talking about the long term, but should milk or certain foods be fortified? What engagement with the food and drink industry has taken place? What would it advocate in that regard?

**Professor Rose Anne Kenny:** If I may respond to the question about vitamin D and chest infections or bacterial or viral infections, again, last week, with colleagues in the UK, we published a paper which looked at the evidence for this in the context of big bolus doses of vitamin D, which would be given infrequently, or taking daily supplementation. The evidence from all the studies that were pooled together - 42 randomised trials involving almost 48,000 subjects - clearly showed a significant reduction in acute chest infections, be they viral or bacterial, with regular, daily maintenance supplementation but not with intermittent high-dose boluses. This, we proposed, may be why there is confusion out there among academics about vitamin D. Giving bolus doses appears to have a different effect on the pathways involved in metabolising vitamin D from daily supplementation with it, but it does have a positive effect, if taken daily, on general bacterial and viral infections.

**Dr. Martin Healy:** I thank Senator Kyne for his questions. I wish to refer to the requesting patterns he asked about. It is interesting that in the past GPs did not really request vitamin D that much and there was no great demand for it but, in the current climate and with Covid and many of the issues surrounding vitamin D in the media, requests for vitamin D have gone through the roof. Practically every patient who goes to a GP now will ask to have vitamin D added to his or her test, even though GPs would not normally do so because they would look at the patient and, as someone said earlier, one cannot tell by looking at the patient whether or not his or her vitamin D level is low. If the patient walks in, sits down, stands up and walks out, his or her vitamin D might be okay, but the issue of the Covid connection with vitamin D and other issues have driven vitamin D requesting significantly higher, so we are now measuring far more vitamin D than we did in the past in GPs' samples.

**Dr. John Faul:** With regard to respiratory infections, I want to back up what Professor Rose Anne Kenny said. It has been looked at in chronic obstructive pulmonary disease, COPD, in detail in large studies which showed that it is protective, particularly in people with cystic fibrosis who respond better after an exacerbation if they are vitamin D deficient and the vitamin D is supplemented. Cystic fibrosis is a particular problem because they have malabsorption of vitamin D. It is routine for cystic fibrosis patients to take vitamins A, D, E and K on a continual basis because of malabsorption. Without vitamin D supplementation they do worse after an exacerbation of cystic fibrosis.

In fairness, we would not be here to talk about asthma, COPD or cystic fibrosis. It appears to be a specific thing for the infection with SARS-CoV-2 and vitamin D deficiency has a powerful impact. That is what we are stressing. I do not think we are here to say that if we give vitamin D supplementation it will cure all ills and fix everybody with every respiratory condition but it is crucial in the current pandemic because of the lack of resources, lack of ventilator beds and the crisis in the hospitals right now. If we can reduce the severity of people's disease, and it must be remembered that pneumonia is the number one killer in Covid and it is taking up our ventilators and people are in hospital for long periods of time, and if vitamin D supplementation can help that I believe we should do it. Within the area of respiratory conditions Covid appears to have a very specific problem in terms of vitamin D deficiency.

**Dr. Daniel McCartney:** Could I make a quick comment? To follow up on what Professor Kenny said, there are other health benefits from vitamin D apart from this well-established reduction in and risk of respiratory infection. We are seeing it in testimony from Professor Carlos Camargo in Harvard University. Professor Camargo is perhaps the world authority in this area as it relates to respiratory infection and vitamin D. In a large meta analysis, which Professor Kenny referred to, of 48,000 patients they discovered that when they parsed this and looked just at people who were getting vitamin D supplementation on a day-to-day basis rather than these large bolus doses, there was a 25% reduction in risk of acute respiratory infection. On that basis alone and on the assumption that the SARS-CoV-2 virus does not differ in any huge way from these other acute respiratory infections that would be included in that, we could argue that we should be supplementing vitamin D. There are other benefits also. Some studies suggest, for example, much lower cancer rates in people who are vitamin D replete over time. I refer to osteoporosis and also heart failure, which is responsible for one in four accident and emergency admissions in this country. In all the areas of cardiovascular health vitamin D seems to be beneficial.

I would like to touch on the affordability of vitamin D also because the last two members, Deputy Kenny and Senator Kyne, focused on that. We see approximately half of the rate of supplementation - this is in young women, and I have done research in this area - in people in the lower socioeconomic groups. Anything we can do, therefore, whether that is a VAT exemption for vitamin D or any other intervention we can do to make it more affordable would be very beneficial. We have to embed it into the culture so that, as one of our colleagues mentioned, it becomes well known across the population like folic acid supplementation in pregnancy, for example, but any assistance in terms of affordability, particularly at this time, would be very useful.

**Chairman:** Has Senator Kyne concluded? He has run out of time.

**Senator Seán Kyne:** Yes. I see that Professor Walsh has his hand up.

**Professor James Bernard Walsh:** Further to Senator Kyne's question on levels and what

Dr. Martin Healy said also, a huge number of people are coming in and requesting certain levels of vitamin D but in fairness to the HSE website it states that we do not need those levels. We know that it is safe. It is like if one is thirsty one takes a drink of water or if one is hungry one eats a bit of bread. We do not need it. We know that it is extremely safe. As we re-emphasised in our study of 36,500 people, we did not have an existential level. From that point of view, therefore, the level we are recommending of 800 to 1,000 international units is totally safe and will bring people up into normal levels. That is all it will do, and one can take it. In winter time, 70% of people of all ages in the Dublin metropolitan area will be deficient in vitamin D, and there is not too much difference with the rest of the country, but all they need do is take it. We only do levels in other people if they are required in particular cases but, ultimately, it is not an essential point.

I dealt with the issue of fortification of food already. We know that Finland has done so and where it has done that it has made a difference in the severity of rickets and the severity of cases. Even with fortification we have not got over the insufficiency levels that we have in Dublin. That is okay. As I said, GPs can prescribe vitamin D so that is something. People have medical cards and that would help to get over the cost issue. The GPs can add it to the prescriptions of people with GMS cards but people must be aware of the fact that GPs have that power. For others, it is very cheap to buy not only in a chemist but even in a supermarket. Good quality vitamin D is very readily available.

**Senator Frances Black:** I thank all the witnesses for an extremely informative discussion. Even though I was always aware that vitamin D was good I did not realise how important it is. I think it was Dr. Daniel McCartney who spoke about the importance of getting out the message, particularly in this very difficult time, about the importance of vitamin D. We need to focus on getting out that message.

It is essential that we introduce a fortification and supplementation policy urgently to combat the deficiency in the hopes of saving people from experiencing more severe Covid-19 symptoms. Last November, we were aware that the UK introduced free vitamin D supplements to those who were at risk of Covid. People could apply to the NHS for free daily supplementation. We might need to look at introducing a similar model, particularly for those who are at risk and also for members of society who are more likely to suffer from vitamin D deficiency such as the elderly and people with more melanated skin.

I am aware of the growing evidence and reports that study the correlation between iron and the efficacy of the vaccine. One very interesting study came out this week from Professor Luke O'Neill at Trinity College Dublin. He spoke about iron and the immune system and I want to ask about that. We know iron is a mineral that we need for all things in our bodies but our immune system needs iron also. The very compelling evidence shows that iron deficiency makes vaccines less effective. Should we be planning to supplement iron as well as vitamin D in the fight against Covid?

**Dr. Daniel McCartney:** I thank Senator Black for what is an interesting question. We know that iron deficiency is very common in the Irish population, particularly in young women. We know that around 50% of young Irish women do not have sufficient amounts of iron in their diet. The research I have conducted with the Coombe Hospital suggests that about 3% to 4% of those women when they present for their first antenatal visit in early pregnancy have frank iron deficiency. That is worrying because it has an impact on the outcome of those pregnancies. There are other reasons, apart from the immunity aspect, that are important in terms of iron nutrition across the population.

I am aware of Professor O'Neill's study and perhaps Professor Kenny will comment on it too. A number of nutrients are suspect across the Irish population so while we are talking about vitamin D today, Dr. Healy for example will tell us that magnesium is a very important nutrient in terms of biologically activating vitamin D in the body. A proportion of people have low magnesium levels in the population, including people who over-consume alcohol, some older people and hospitalised patients. That might be an issue as well. Zinc and selenium are also important nutrients for immunity.

To focus in on vitamin D and iron, we see a high prevalence of deficiency in vitamin D right across the population, in men and women, young and old, among immigrant populations and populations of Irish ethnicity. Vitamin D deficiency is ubiquitous but I take the Senator's point that iron deficiency is an issue that needs to be addressed among our female population in particular and also among our elderly. Professor Walsh and Professor Kenny will also have a view on that.

**Professor James Bernard Walsh:** I would add that iron deficiency in pre-menopausal menstruating women is something of which we are very conscious and obviously pregnant women are very conscious of their iron stores. It is important to point out that we do not often see iron deficiency in men. It is not often that one would see such a nutritional deficiency. Obviously with malabsorption syndromes iron deficiency would be a feature but in the absence of malabsorption syndromes, the ordinary run-of-the-mill person, apart from pre-menopausal or pregnant women, will not run into this problem. In fact, if a person is iron deficient, it is very important to look into it and exclude things like bowel cancer and other cancers that cause a person to lose iron. When we meet patients with iron deficiency, we focus on whether there is an underlying medical cause for it. We ask whether they are passing blood in the urine or rectally. These are the issues we examine and the focus must be on that.

Professor O'Neill's work in Trinity is very relevant and others have also shown us that iron and other elements are an important part of optimising the nutritional response.

**Dr. John Faul:** I thank Senator Black for her question. We measured a lot of nutritional elements in the initial SARS outbreak. At that time we had no idea what was going on with Covid-19, who was susceptible and who was not. We measured iron in great detail, including ferritin, which is an acute-phase reactant related to iron transfer and iron saturation. In people who were very sick with Covid, iron deficiency was not a significant factor whereas vitamin D was very much an eyebrow raising factor. We have measured it in detail.

**Senator Frances Black:** I want to ask one other question if I may. Are there consequences for people who take too much vitamin D? I know the recommended level is between 2,000 and 4,000 but when my sister was in the US, for example, she used to get vitamin D supplements of 10,000. If people take too much, what are the consequences, if any?

**Dr. Daniel McCartney:** That is an excellent question and one that is very pertinent to the discussion today. This is really why we need explicit guidance for the population on vitamin D. There is lots of justified discussion on the role of vitamin D in immunological health as it relates to SARS-CoV 2 and what we need from the Department of Health are explicit guidelines on the appropriate level of supplementation so that people do not over-supplement and put themselves at risk. We heard today that a number of agencies including the European Food Safety Authority, the Institute of Medicine in the US and the Scientific Advisory Committee on Nutrition in the UK, are all unanimous that oral intake of vitamin D up to 100 mcg per day is safe. We have very large population studies of people who have been supplemented at 50 to



100 mcg over extended periods of two to five years which have shown no instances of toxicity. Professor Walsh's work is also relevant. Of the 36,000 people whose blood levels were evaluated in the Dublin region over the past five years, only 21 had levels over 250 nanomillilitres per litre and none had high calcium levels in their blood, which is the tell-tale sign that one has too much. Vitamin D toxicity is extremely rare. One can encounter it in some clinical conditions like sarcoidosis, tuberculosis, lymphoma and other granulomatous diseases but those hazards, or potential hazards, with vitamin D will be telegraphed to such patients by their primary physician. I will hand over to Professor Kenny who may want to comment on this further but overall, vitamin D supplementation is a very, very safe and effective intervention.

**Professor Rose Anne Kenny:** I will begin by explicitly explaining that the 10,000 international units, IUs supplement that the Senator's sister is taking would be prescribed generally as a once-weekly or possibly twice-weekly dosage. It would not be prescribed for daily dosage. I am sorry that we are moving from micrograms to international units because it can be confusing but when we talk in big figures, in thousands and tens of thousands, we are talking about international units. I would echo Dr. McCartney's point that we need explicit guidelines for that very reason. Rare as vitamin D toxicity is, we do need NPHET to make an explicit recommendation and to provide guidelines.

**Senator Martin Conway:** Senator Black has stolen my thunder as I was going to ask about the over-intake of vitamin D.

My first question relates to countries with the same type of profile as Ireland in terms of a lack of fish in the diet and so on. Are there any similar countries doing it better in terms of public health interventions around vitamin D? Is there anywhere we can learn lessons from and possibly replicate?

I wish to develop on the conversation that the witnesses had with Senator Garvey earlier about their engagement with NPHET. Have the witnesses made formal representations to NPHET? Have they presented to it? What has been the level of engagement to date? I take on board the witnesses' argument that clear advice is needed. What representations have any of the witnesses, or the bodies to which they belong, made to NPHET? How has that engagement gone? I do not mind who answers that one.

**Professor Rose Anne Kenny:** If we go back to NPHET, as a result of some colleagues on this call raising parliamentary questions, HIQA was asked to produce a rapid evidence summary on vitamin D and Covid. That was more or less NPHET's response to the accumulating evidence and publicity around this.

**Senator Martin Conway:** Professor Kenny is saying NPHET's response was to ask HIQA to do a fast-track report on the benefits of vitamin D from a Covid perspective.

**Professor Rose Anne Kenny:** That is correct.

**Senator Martin Conway:** I suppose NPHET has now received that report. Has it given any commentary on it?

**Professor Rose Anne Kenny:** Not to my knowledge. Someone else may be more aware but I have not heard anything more than that this has been made public. We also have a number of issues with that report. One of the first recommendations is: "In the context of COVID-19, advice has previously issued recommending that individuals that are self-isolating or unable to go outside should consider supplementation." In the context of everything we have discussed,

the committee can see how inadequate that statement is.

**Senator Martin Conway:** I appreciate that. Perhaps we as a committee might look at writing to NPHEt to get a view of where it is on this. Clearly, the Government will take its advice from NPHEt so influencing NPHEt is extremely important.

I have another question. It has been put to me by a couple of pharmacists, including a pharmacist I am friendly with who was a member of this committee in a previous Oireachtas, that vitamin D really should be distributed by pharmacists free of charge and that that is the ideal situation. Has the consortium a view on that?

**Dr. Daniel McCartney:** That is an excellent idea. While we can look at targeted provision to specific groups, we have seen from our discussions today that this is a cross-population issue. In the absence of food fortification, vitamin D provision to people through the pharmacy network would be appropriate but it should be particularly focused on some of the at-risk groups.

To pick up on the Senator's previous point on safety, it is really important for the committee to understand that while we have been talking about food, it has never really been the primary physiological source of vitamin D. Most of the vitamin D humans get is physiologically contributed by sunlight exposure. We therefore find ourselves at an interesting juncture in human evolution because we all decided to move indoors 30 or 40 years ago and vitamin D levels have really dropped because of that. Proposing food, at least natural food, as an intervention here is not really going to be effective. We may get somewhere along the line to adequacy by developing more coherent and effective food fortification policies but we must recognise that in the absence of sunlight exposure it is very difficult to add sufficient amounts to food to make a manifest difference that will get people up to the blood levels required for immunity.

**Senator Martin Conway:** The general consensus is that too much exposure is bad for a person, however.

**Dr. Daniel McCartney:** Absolutely so and we are not advocating that.

**Senator Martin Conway:** Therefore, while I take on board Dr. McCartney's point that the reason levels of vitamin D have dropped is because of the lack of exposure to sun, avoiding excess exposure has been done for other beneficial health reasons around skin cancer and so on.

**Dr. Daniel McCartney:** We absolutely would not argue with that advice. The best thing to do here is to avoid too much sun exposure and take a vitamin D supplement. We agree with the Senator.

**Professor James Bernard Walsh:** If we are looking for a country that could be an example here, Finland would be a good one. Before Finland went into food fortification only a third of the population was vitamin D sufficient. By 2011 that figure was 90%. The good thing about it was that when they measured, the average level was 75.9 nmol/l. That is exactly the kind of level that would be optimal. Therefore, we have a country which became proactive with the fortification of food and did not run into any toxicity levels either. They are the kinds of things which are crucial. It can be done and done safely. Going back to what Dr. McCartney said, the sun is where a person will get 90% of his or her vitamin D. Twenty minutes of exposure to a person's hands is all that is really required to keep a person optimised. However, in this country we do not get any vitamin D from the sun from October to April. It does not happen. Even the little bit of sun that is out there is very low in the sky, and hence food fortification. Vitamin D is stored if a person gets a lot of it but there is a limit to how long that storage lasts. That is why

we in Ireland have 70% insufficiency or deficiency levels in winter time, as mentioned earlier. That is why supplementation in tablet form of 800 to 1,000 units per day is important for people if they are not getting a very comprehensive food intake, which we know the majority of us are not.

**Senator Martin Conway:** I thank the consortium.

**Chairman:** Deputy Shortall is looking to come in.

**Deputy Róisín Shortall:** I just have a few additional questions. Firstly, what would be the consortium's explicit guidance to the population on the level of daily supplements they should be taking?

Secondly, given the data the consortium has provided showing 70% of people, especially in Dublin, are vitamin D deficient, how long would it take a person taking their daily dose to sufficiently build up his or her immunity?

My third question relates to a point Professor Kenny made earlier which I did not fully follow. The other day I happened to meet somebody who was coming from having his prescription filled for a monthly capsule. I was surprised by this as I had not come across monthly capsules. Has the consortium a view on daily, monthly or weekly supplements? Is there any difference? Furthermore, is there any difference between tablets and capsules?

I will finish by making two points. The point about wild versus farmed salmon is very interesting and certainly news to me. There are not many people who have the opportunity to eat wild salmon these days. It is thus important to get across the message that people are not getting vitamin D to any extent from farmed salmon, which is standard.

The other point is positive. I was in a Boots branch recently stocking up on vitamin D for myself and my family and I had difficulty getting it at sufficiently strong doses. The shop assistant told me it is flying off the shelves and they cannot keep it in stock. This is a very good sign. People will often just vote with their feet; they can be very sensible about being active in maintaining their own health. Of course the point has been made by many people that much of the population does not hear those health messages because they are not coming out clearly enough. Equally, much of the population is not in a position to afford it. We must therefore be very clear that there must be Government intervention as well as strong public health advice. I would appreciate it if those few questions could be answered.

**Professor Rose Anne Kenny:** On supplementation, the public health message and vitamin D flying off the shelves, the Health Research Board, HRB, funded a study where we looked at vitamin D supplementations during Covid. We also had data pre-Covid relating to people aged 50 years and above. The prevalence of supplementation for vitamin D pre-Covid was 9% and the majority were women. During Covid, it had increased by a further 14%. That looks like 23% coverage. I suspect it is higher now over the past number of weeks because there has been further publicity.

There is emerging data that taking large bolus doses, possibly even monthly, may not have the same beneficial effects as more regular supplementation. It is new data and needs more work. I personally would not be comfortable taking a bolus dose once a month instead of more frequent supplementation.

**Deputy Róisín Shortall:** Is a daily dose the optimum?

**Professor Rose Anne Kenny:** Daily definitely is the optimum.

**Deputy Róisín Shortall:** What about the explicit guidance on the level?

**Professor Rose Anne Kenny:** That should be 800 to 1,000 units daily. Nursing Homes Ireland sent a recommendation to all of their nursing homes to ensure nursing home patients are on vitamin D supplementation. If they were not, one would generally double up the daily dosage for a number of weeks until such a time as one is satisfied the levels are within the range one wants and then continue with a lower dose of daily supplementation. That is the guidance that Nursing Homes Ireland has provided.

**Deputy Róisín Shortall:** How long does it take to bring it up to a sufficient level?

**Professor Rose Anne Kenny:** That is very variable depending on how low the level was, as well as on the other conditions associated such as darker skin, obesity and other health comorbidities. That should probably be discussed with one's doctor.

Generally speaking, for a person in the community, I would say double what we are recommending for two months. In other words, one should take 2,000 international units a day for two months and then reduce it to 1,000. That would be a reasonable recommendation.

**Deputy Róisín Shortall:** Is that the equivalent of 25 micrograms?

**Professor Rose Anne Kenny:** Yes, 400 is 10 mcg.

**Dr. John Faul:** We have looked at people who had Covid and were vitamin D deficient and looked at them in clinic six months afterwards. While 75% of them were vitamin D deficient when they were sick, when we told them to take supplements and gave them prescriptions for a period of 1,000 units a day, 35% were still deficient at the end of it. It was better but not great. Obviously people forget to take the tablets. When we asked them afterwards, they were not quite clear that it was important. They said they took them for a little bit but then forgot. The levels would go up after two to three weeks but even six months later people tend to forget. That is why the messaging has to be important, strong and persistent about vitamin D supplementation.

How long does it take to improve one's immune system? Generally, we would say that if one impacts one's immune system severely - for example with a high dose of steroids - it takes about three months for one's lymphocytes to recover from that. If one has, say, a death in the family, then three to six months later one gets shingles, it means one's immune system is hit in some way. We think the same is for recovery. When one tries to boost someone's immune system - say, the person comes off chronic steroids - one's immune system only really recovers three to six months later. It is at least three months. That is why there is an urgency about getting supplementation into people now because time is moving on. The commonest thing that our patients are asking us is why were they not told this last year as it could have saved so much trouble considering it takes months to build up one's levels.

**Deputy Róisín Shortall:** Is there any difference between tablets or capsules?

**Dr. John Faul:** No.

**Chairman:** The main ask of the witnesses is that there would be explicit and prominent public health messaging from the Department of Health and the HSE urging people to take higher doses of vitamin D supplements in consultation with their GPs, particularly if they are in the

at-risk groups. The witnesses are saying there is no real downside to taking vitamin D. They are also asking for the opt-out model, particularly for nursing homes. Their figures suggested that one in four of us are vitamin D deficient, particularly in winter. One cannot really overdose on vitamin D. It was suggested there would be clearer messaging coming from NPHE. The committee has invited NPHE to come before us and we will raise with it the whole issue of vitamin D. We will also have the Minister for Health. Again, we can look at that.

The witnesses spoke about a dosage of 800 to 1,000 mcg a day. The point was made that many people are actually being proactive about their own health and shelves being emptied of vitamin D. While people are acting on this themselves, we need that public messaging and explicit guidelines.

Vitamin D is one of the building blocks of our immune system. Several years ago, the view on cancer was that one's immune system was not really important. We know now from evidence that it is vital and our immune system breaks down cancers every day. We all have cancers in our systems which one's immune system breaks down. It is important having one of those building blocks in relation to that.

Is there anything else the witnesses want this committee to look at? We will make recommendations. Vitamin D deficiency is common across all age groups in the Irish population. Up to 47% of 18 to 39-year-olds are deficient. Up to 60% of 50 to 59-year-olds are deficient and 64% of over 80s with 80% of those in nursing homes. That is the evidence of the importance of nursing home residents getting vitamin D. Up to 94% in dark skin or Irish BAME, Black, Asian and minority ethnic, communities are vitamin D deficient. The groups with the highest prevalence of vitamin D deficiency are those with obesity, dark skin and the older population, the very groups with the highest risk to Covid-19. The witnesses pointed out recent studies have also shown the significantly lower risk of ICU admission and deaths among Covid-19 patients who were supplemented with vitamin D.

Do the witnesses want to reiterate any of these points? Is there anything they want to ask of the committee? We all accept there needs to be clear messaging. Will someone do a summary?

**Professor James Bernard Walsh:** On the point about units, it is important to clarify that it is 800 to 1,000 units which is 20 to 25 mcg. With regard to the level at which one is deficient, while technically a level of 30 nmol/l is considered deficient and a level 50 nmol/l is classified as sufficient, it is important that we look upon anything less than 50 nmol/l as insufficient. In that case, 70% of people among all age groups we are seeing in winter do not have sufficient vitamin D. This is the case across the entire Dublin metropolitan area. That is a simple figure. Professor Kenny's work with the Irish Longitudinal Study on Ageing, TILDA, shows a similar result for the whole of Ireland. That is what we are talking about. We should talk about sufficiency. At this point in time, only 30% of the Dublin population has sufficient vitamin D and it is no different for the rest of the country. This is the case across all age groups.

**Deputy Bernard J. Durkan:** Am I to conclude that there are no medical conditions which are likely to be aggravated by high doses of vitamin D?

**Professor Rose Anne Kenny:** We never say "no" in medicine but it is extremely rare. If it occurs, it causes an elevation of the calcium level. It is as rare as hens' teeth, however, and certainly should not guide this important public health message in this context. We are here because of Covid and vitamin D has an added value in the context of the Covid pandemic.

**Professor James Bernard Walsh:** Conditions such as sarcoidosis may result in increased sensitivity to vitamin D. People who have such conditions would be under the care of a doctor anyway and this doctor would advise them. There is also an issue for people who have kidney stones but their problem is often with excess calcium intake. Such people would also have to be monitored. All of these people would, however, be aware of their conditions. I repeat that even the Food Safety Authority of Ireland and others have said that the crucial thing is to measure is the excess calcium or vitamin D in one's blood. We did not find this among the 36,500 cases. That is important. It must not be forgotten that what we are recommending is 800 units to 1,000 units. As people have repeatedly said, internationally up to 4,000 units a day is considered safe. We are not going near that. We are way down at a fraction of that. The Department of Health has recommended 600 units for deficiencies but we are saying that 800 units to 1,000 units would give people sufficient vitamin D, defined as a rate of 20 nmol/l or more. There is not a lot of difference but that statement must be put out quite positively. This has been done in Finland and elsewhere and is now being done in the UK. We must come out strongly to say that we need to optimise not only our bone health but also our immune system.

**Dr. John Faul:** I just have a word of clarity for Deputy Durkan. There is a condition called hypervitaminosis D. People who have this condition have excessively high levels of vitamin D in their blood. This is not caused by eating vitamin D supplements but the processes about which we were talking such as sarcoidosis, some lymphomas and so on. The classic example is sarcoidosis. This is an inflammatory condition where the body creates an enormous amount of vitamin D and it is not regulated by calcium in the blood. Normally, calcium in the blood stops this. It is not regulated, even locally, by vitamin D levels. It is an automatic production of vitamin D by inflammatory tissue. The treatment for it is steroids and anti-inflammatory therapy. Just for clarity, the hypervitaminosis D about which one hears and which can be toxic is not caused by eating supplements but an underlying condition. If the underlying condition is treated, it goes away. We have many patients with sarcoidosis but we give them vitamin D supplements.

**Dr. Martin Healy:** On how long it takes for vitamin D levels in one's system to increase once one starts taking a supplement, in the general population it takes a few weeks if one is coming from a very low base. It can take a while. This is the case when using the commonly available vitamin D supplement, vitamin D3. There are other supplements which act faster but they are only used in acute situations such as in the ICU when a person's level must be increased very quickly. When one takes a supplement, one may be anxious to see if one's levels have gone up, but a repeat test cannot be carried out within three months. One must wait three months before a repeat test can be carried out for the level of vitamin D in the blood. This is because of the way vitamin D is handled in the body. It takes a while to get to what is called a steady state. It takes a minimum of three months and sometimes longer. While it is inappropriate, we often see requests for vitamin D testing two weeks after supplementation has begun. This does not give an accurate picture.

**Deputy Gino Kenny:** Do any of the contributors have any opinions on ultraviolet lamps emitting vitamin D? Some people who have acute seasonal affective disorder, SAD, use them. Do any of the witnesses have opinions on using ultraviolet lamps to absorb vitamin D into the body?

**Dr. Daniel McCartney:** I can take that. There are certainly lamps for SAD. These use white light at specific wavelengths which are higher than those of the ultraviolet B, UVB, radiation associated with vitamin D. Even though there is a crossover between SAD and the

depression associated with vitamin D deficiency, the remedy with regard to light therapy may be quite different. The UVB radiation to which one must be exposed to synthesise vitamin D has a wavelength of 290 nm to 315 nm whereas the white light associated with better outcomes in people with SAD is higher at about 400 nm. Does that answer the Deputy's question?

**Deputy Gino Kenny:** To a certain extent, yes. I know people who use such lamps in the wintertime and they find them very beneficial. Scientifically, I do not know what amount of vitamin D people absorb. People do find solace in them because the lack of light in the winter months can have a detrimental effect on people's well-being and sense of life. Some people do find them very beneficial.

**Dr. Daniel McCartney:** Absolutely. There is good research behind that which suggests that melatonin is suppressed by the exposure of the back of the eye, the retina, to that white light. It is very well established that the physiological response to that white light is responsible for some of those better outcomes in persons with SAD.

I would like to follow up on a number of questions or issues raised in summation. Deputy Seán Crowe raised the issue of opting in. Under the UK scheme, even though, in theory, vitamin D supplementation is being provided free to 2.7 million of the UK's most vulnerable citizens, it is being provided on an opt-in basis. That is an example we should not follow. It must be operated on an opt-out basis if we want supplementation to be effective for vulnerable groups, such as people in nursing homes, our black and minority ethnicity, BAME, communities, our front-line healthcare professionals and people arriving to test centres. We cannot rely on people having the knowledge to know that they need vitamin D and to take the appropriate action. It needs to be provided on an opt-out basis.

The other issue I will raise is that we have borrowed a lot of the guidance from the UK in this area and a lot of the evidence our statutory agencies have reviewed in this regard has also been from the UK. That evidence has focused on musculoskeletal health. It is really important that the committee understand that the thresholds for blood vitamin D that must be achieved for some of these skeletal benefits are much lower than those to be achieved for immunological function, including for defence against Covid-19. Were NPHE to review this evidence, we would need a specific review of the evidence on immunological health as it centres on Covid-19. Reviewing the evidence of vitamin D in respect of musculoskeletal health does not bring us any further along.

The other thing to realise here in the context of that information is that the randomised control trials that many people have requested and that we would all like to see in this area may never happen. Professor Kenny will say that the biggest of those studies is in Córdoba in Spain where some 1,000 individuals have been targeted. They are on 300 at the moment after the elapsing of nine months in that study and may never reach the 1,000 patients.

We cannot wait for those randomised control trials. There is a model or paradigm called the Bradford Hill criteria for causality and the evidence that we have in relation to vitamin D and Covid-19 already meets those Bradford Hill criteria. These are the same criteria that anti-smoking interventions have been based on, which as we said earlier have been very effective.

Finally, on the issue of our population, we mentioned obesity. Obesity affects approximately 60% of our adult population, who are either overweight or obese. The dosage of vitamin D one requires if one is overweight, that is a body mass index, BMI, of between 25 and 30, is about one and a half times what a person of ideal weight would require to raise their blood

levels by the equivalent amount. When one gets into the obese category, that is a BMI above 30, then one may be looking at a dosage of about two to three times to achieve the equivalent level of increase in the blood. Even though 20 to 25 mcg per day may be sufficient for most of the adult population to reach the required threshold for immunity against Covid-19, there is a significant proportion of the population who will require supplementation at higher doses than this, including people with darker skin, our nursing home residents, older adults, and some other vulnerable groups old as well.

That is all I really have to say but as a group we will be delighted to engage with NPHEAT if that opportunity arises and to furnish the committee with any further information that they require on any of the issues that we discussed today.

**Chairman:** I thank Dr. McCartney very much. For safety reasons we must now bring to an end our committee meeting today. I thank everybody for their contributions. I give a commitment that we will follow up on many of the issues that they have raised here today with the various people who will be appearing before the committee itself.

That concludes our business for today and the committee will meet again in public session on Tuesday next, 2 March at 4 p.m. when the Minister of Health, Deputy Donnelly, will be providing us with an update on Covid-19-related health issues.

The joint committee adjourned at 11.54 a.m. until 4 p.m. on Tuesday, 2 March 2021.