

Transcript: Sleep Junkies Podcast Episode 005

Sleep Research Roundup Dec 2018 - Dr Neil Stanley

<https://sleepjunkies.com/sleep-research-roundup-dec-2018/>

Jeff Mann: Well, this morning we're with Neil Stanley. Good Morning Neil.

Good morning.

Neil Stanley: Thanks so much for joining us this morning Neil. Can I, can I just ask you before we get into the nitty gritty, in your view, have you seen the amount of research and sleep science increase over the years?

00:44 Neil Stanley: No, absolutely. I mean I've been in this game for 37 years now and when I started one journal published papers about sleep, which was called Sleep, and there was sort of pretty much one textbook which was The Principles and Practice of Sleep Medicine.

And now there's an absolute deluge of sleep information. I mean, there's tens of sleep journals, but the other thing that perhaps has changed is that papers pertaining to sleep are published pretty much across the board.

And this is, this is of course a problem to try and keep on top of the field because, you know, whilst I am subscribing to the sleep journals, you can't subscribe to every journal. And so important information is coming out in an obscure to me as a sleep expert, obscure journals. And so you really do have to try and keep abreast of the information.

3:35 And so say 37 years ago, maybe a hundred hundred and 50 papers the year were published in sleep. Now it seems like there's 100 a week being published.

And what's interesting is, although there's all this information is actually making the field more complex rather than clearer, which I think the idea was to try and find out, you know, why we sleep, how we sleep when we sleep etc.

But all we're doing is making it vastly more difficult to actually find the answer. And that's one of the great challenges. And one of the reasons why the field is so very, very interesting. But I don't think we're any better understanding. We have much more information, but we have just about as much understanding. Unfortunately,

4:28 Jeff Mann: I love the fact that it's so complex. I was doing an interview, writing some interview questions for someone last week, and I asked the question, 'how does a sleep expert, a sleep professional, someone who's been studying sleep 20 years in their life, take on board that sleep research and sleep science is multi disciplinary?' - let's say you've dived into your field and you've been a specialist for 20 years and then you realize as you say, there's these findings coming from obscure journals of whatever it is ... Agricultural Science or something... something that has come from left field, but it's totally related to what you do as well. I find that really fascinating because academia and, and research is very much about specialization, isn't it?

5:15 Neil Stanley: Yeah. I'll tell you a quick story. When I was at the University of Surrey I created and ran the world's largest clinical trial sleep laboratory, we had a world class team within our little school. But one night I wandered over to the main campus and there was an event that was hosted by the psychology and sociology department.

So I met these people I'd never met before, even though I was in the same university and said, oh, what do you do? Oh yeah, we researching into sleep. Oh, I do as well, but we've never met. And you know, that's the problem. The specialisations.

You know, there's a big argument in the sleep field about sleep medicine as to whether sleep medicine is sort of a speciality within itself or whether sleep medicine is part of every medical speciality and you know, do we go into these little silos at our peril, do we actually miss things?

And what's interesting, it's a very general point to make the sleep literature is becoming really quite prosaic, it's becoming very, very clever. And frankly I don't understand half the papers published.

Whereas some of the more interesting work is actually the work being done with patients or particular population groups - where should we say, more real world type research.

So it's looking at, you know, pain and sleep and cancer and sleep, things like this, that might have a specific effect on the patient, whereas the sleep literature, as I say, is becoming really quite, you know, the basic points have been done so we now have to be clever. But unfortunately I haven't read a decent paper recently that has actually said we should be doing this to our patients - that sort of basic information hasn't come out.

7:20 Jeff Mann: I totally relate to that. But anyway, let's talk about it. Let's jump in. Four studies that were all released in the last two months, either in November or December 2018. So, there's so much other stuff out there, I mean we could, we could probably fill up podcasts every day talking about different sleep studies.

So I just picked four. The first one, it's in the field of circadian biology. This was quite widely reported in the media and what caught my eye about this, it's about new findings, about the biology of the cells, the light sensitive cells in our eyes and how they can disrupt our internal clock and relating that to screentime.

But what caught my eye was, some of the headlines, and again, it's interesting how the media reports these studies, that this is interesting because it's not just about blue light, because we hear so much about how the blue light from our laptops and screens are detrimental to sleep. But how just exposure to light in general is bad for us. So this is the report from the study from Cell.com. Neil.

8:31 Neil Stanley Yeah. She's one of these papers that, you know, the press release is quite clear, but the paper makes absolutely no sense to me, I'm sure it's brilliant science but I, I must admit I struggled to follow the story. But with that said, the findings in the press release are interesting.

As you say, over the last 15 or 20 years, there's been an ever increasing focus on blue light as being a bad thing, certainly before going to bed. There has been other work that shows that the things that strip out blue light, you know, [F.lux](#) and NightShift, actually make no difference to their effects and even the Kindle Paperwhites can also disturb.

Jeff Mann: Can you just explain what they are to any people have not heard of those bits of software you mentioned?

9:34 Neil Stanley: Well, these, these are things that have been put in by companies like Apple, that strip out the blue wavelengths of light out from the screen, therefore supposedly reducing the effect that any light would have.

But unfortunately by stripping the blue light you make the screen very muddy and dark. And all that happens is the people turn the brightness up.

And we say we become quite obsessed with this blue light idea as being the only bit of light that is problematical. But we know that bright light is problematical and there has even been studies that shows that fire light is bright enough. And we all know that fire lights from the campfire isn't blue at all it's much more orangey yellow, but that is even bright enough to disrupt our circadian rhythms.

So the Cell study that you're talking about as I goes very much into the biology of how this might happen.

But you know, going back to a very primitive view of life for the last 400,000 years, we have had fire light and, and up until the industrial revolution, it was fire, light or moonlight. And that is what we've evolved to respond to. So daylight is much, much brighter, but dusk, is more orangey. Red Sky at night is as the proverb says, without that blue light, and that is the indicator.

So any light, any bright light is *more* than darkness, and that is the problem. So we haven't yet evolved to live in a world with artificial light that's constantly on.

So we really do need to sort of go back to firelight and candlelight in the evenings if we want to fully prepare ourselves to sleep and to avoid any influence of know high, high intensity external light.

11:49 Jeff Mann I don't know if you're able to break it down any more as what's significant about this research.

11:57: Neil Stanley: I think the only significant thing is that it's about the mechanism. We've known the effect of light. This is about the mechanism, however, all it does is lead to the simple, sort of one word or one sentence conclusion at the end, which is avoid light before bed.

It doesn't help us. And at the end of the day, this is the first of many papers, I'm sure, and in 10 years time we will be looking back at this day thinking, was it really that simple? Because we really don't understand these processes very, very well.

You know, there is the recognition that these receptors exist. They respond to blue light specifically. The mechanism is important, but there will be more studies on how other wavelengths of light affect this mechanism and what effects that may have, as a human being and how a human being sleeps. But as I said, this is the first of many, many papers in this field.

13:15 Jeff Mann: Yeah, I'm fascinated by this topic of light and sleep and I guess most people are kind of unaware of all the connections between it, but that's another chat for another day.

However, it's a brilliant segue into the next piece, but this one is about light as well.

So this is the report from the AASM about [light pollution](#). It's a long term study. They did over 11 years, 50,000 over sixties. And what they did, they did a population study and they made an association between outdoor light - so this is about outdoor light as opposed to indoor light.

And they found that in areas where there was more outdoor light, it was associated with higher cases of insomnia. And they measured that by tracking the uptake of [sleeping pills](#).

Now you can probably describe that in a more eloquent.

14:11 Neil Stanley: The interesting bit there is the use of hypnotics. This is a slightly inaccurate way of doing it of course, because certainly, I mean this wasn't UK research, but in the UK there is a huge issue with giving out sleeping tablets.

And so although there are plenty of sleeping tablets prescriptions, it's difficult to say that that would be an accurate measure of those people who are claiming to have insomnia. I said about doing real world research. This is an ideal example of that.

We know as mentioned before, light does have an effect on sleep and we know now some authorities are putting in these very bright, uh, LED bulbs, rather than the sodium bulbs that were there before. And so there's a much harsher light.

And there again have been studies showing, you know, environment light can disturb sleep. But I think this is one of the first that shows a sort of a direct link between the two.

Although there can be other factors, you know, poverty or unemployment or, or whatever. You be. No, poor people can't afford heavy blackout blinds where there's more streetlights. And also potentially areas that have more street light may have more activity. And maybe noise is a factor, but it again shows that humans are not really designed for this modern day world we live in.

And as I say in the past, we didn't have artificial light. And again, this is a very modern phenomenon, the first gaslight, uh, in London in 1812, and it was much, much later before we started getting streetlights or environmental light everywhere.

And so again, it is something that affects us. We need to think about using blackout blinds or curtains in order to stop these affects on sleep.

We need to go to bed very, very dark. I've spoken to so many people over the years who've said that they make their bedrooms completely dark and their sleep improves massively. This probably the easiest thing that we can do.

Jeff Mann: We live in an apartment block and occasionally you'll walk past of the building at night. And I'm, I'm quite shocked to see a, sometimes some of the rooms and they're lit up like a nightclub or like a McDonald's. It will be like 9:00, 10:00 at night. But I think just a lot of people just get so used to, you know, they've got the TV, the big screen going, they've got all the lights on in the house and it's, quite simple really, isn't it?

As you say, it's dim, the lights and then at night complete blackout if you can.

17:36 Neil Stanley: Yeah, as close as possible. Last year or the year before, everybody was talking about this idea of Hygge, this Danish idea of comfort and relaxation, which is true. The Danes are like that.

But what the Danes and the Swedes and the Norwegians do is they light candles at night. Their houses are very, subduely lit, which is a, which is a nice comfortable feeling to wind down to, rather than say a 6,000 Kelvin bright light LED bulbs, which are fine if you're, if you're doing some close-up work.

But as something to use at night time. It is just terrible. And the problem is, of course, most houses, you have one light and it's either on or off yes you can get a dimmer , but they're the same thing.

Whereas actually you need to have, you know, daytime light and you have nighttime light and if you can't change the bulbs and least go out and buy some candles, you don't need to watch tv with the lights on. Probably you don't need to be watching TV either, as you say, with these big huge plasma screens, that light your room up like a cinema that, that's probably not really healthy.

But you know, I'm with you. I mean, I often walk back from the station, and there's a particular house, that just looks – it's bright white, light at midnight and there is no way that person is, is going to go to sleep.

But as I say, the other thing is this external lights, you know, these, these councils who are for energy, saving ideas, replacing sodium lamps with LED lamps. And so you have these streets which are white, brightly lit with, you know, very bright white light, which is really disrupting towards sleep. So in this case really somebody should be suing the council to, you know, install blackout blinds.

19:50 Jeff Mann: Well that's interesting because I remember seeing some, some news about this probably a couple of years ago in America, in LA, I think it was where they were talking about putting in white lights -LEDs aren't, but is that happening in the UK as well?

Neil Stanley: Yeah, yeah. There are, councils in the UK that have done this because the government carbon targets and all this sort of thing. And I think there are plenty of ways of reducing electricity use that aren't disruptive to sleep rather than putting LED bulbs in residential areas. That's just crazy.

There's the option, either the council switch off your lights, which is happening or they put these really, bright lights in. I'm not sure either of those two are sensible behaviors, considering how many companies every night leave every light in their office block on. I would have thought that legislation to stop them doing that would be vastly more important than disturbing the sleep of people living in residential areas.

20:57 Jeff Mann: Yeah, I mean if we can't get rid of the streetlights, then certainly things can be done. Certainly we don't want whitish LED lights, but I guess for most people, as you say, as you said originally, is making sure that the study was about outdoor light so we can control our indoor lights.

Neil Stanley: Yeah, I mean any light in the bedroom is, is bad. And the problem is even light somehow from an extension socket, that glows red, that sort of thing. Any light is bad and you should be aiming for no internal light. Then if it can be covered up with duck tape or something like that up. And I say if you've got external light, either black curtains or buy an eye mask, a comfortable eye mask. Go for blackout. You won't regret making your bedroom darker.

21:51 Jeff Mann: It definitely makes a difference. I know I read somewhere, even the light that's coming from your alarm clock, it seems quite ironic really, but even the light coming from the alarm clock is enough to disrupt your melatonin and disrupt your sleep.

Absolutely. And there was a study a few years ago that shows that really quite low level levels of light in the bedroom are linked with an increased risk of breast cancer in women. So, you know, there, there are sort of longterm as well as short term benefit for making your bed.

22:25 Jeff Mann: All right, well this two different studies about lights coming from very different angles. It kind of gives a bit of context of what we're talking about before about how hard it is to report things and sometimes we see the headlines, but there's a lot more behind the headlines is as we're finding out.

So the next one, number three, this one I, I've got a bit of a problem with and I'm sure you've got something to say about this as well. This was a study that was published on the fifth of December and the headlines are, *"Too much sleep can kill you, scientists say"*

Big study, 116,000 participants and they found associations between - one of the associations they found that if you sleep more than the recommended amount, which is six to eight hours, you had a higher risk of risk of death and risk of cardiovascular, ie heart problems.

And so if you sleep more than the recommended time, which is six to eight hours, you've got a higher risk of this factor. But the headlines that came out were too much sleep can kill you.

And to me, my personal opinion is that as a whole, society, we don't get enough sleep. So I've got a bit of a problem with it, you know, these headlines. Because I think it's a bit misleading because there's a lot more in this.

23:33 Neil Stanley: Yeah. The headlines about sleep, on the one hand you've got the, the short sleep pills you train of thought. So we're in the midst of the worst epidemic of sleeplessness and we're all gonna die because we're not getting enough sleep.

And then you've got studies like this, and this is not the first study that has shown a long sleep, long duration sleep is, is linked with negative health outcomes.

Now What is interesting about these studies is that what they do is they just portion up sleeping in five to six hours, six to seven hours, seven hours, eight hours, etc. Etc. And they just look at, you know, these hour long bins and see whether there is an increased risk in these things.

And it's a bell shaped curve. Essentially, if you sleep roughly average, you will have the lower of grades of most, most conditions. If you sleep more or less than average, you will have a higher rate of most medical conditions.

But what we know about sleep need, is that sleep need is to a great degree, genetically determined and it's more than just six to eight hours. Six to eight is an average is not an ideal.

And just as you have, you know very short people, you have people the size of Warwick Davis who's below 4 feet tall, and you have 8 foot tall basketball players. Now they are the extremes, but they exist however, they are almost certainly going to have higher rates of various illnesses associated with this extreme.

I'm two meters tall and I can read as many papers I like telling me that I'm going to, because I'm tall, I'm going to have a high rate of this, that or the other. The problem is, I can't do anything about it. I'm 2 metres tall, that's it. And the same is with sleep.

25:55 Neil Stanley: So this takes into no account as to what the normal amount of sleep for these people are and whether they are sleeping more than they need or less than they need.

They're just looking at the number of hours of sleep. So there may be a reason why some people, whether it be genetics or whether it be lifestyle, who can sleep more than nine hours a night.

I think these blanket headlines don't do anybody a good favour. They should be trying to explain that It's not about, you know, you being a long sleeper or a short sleeper, it's you sleeping more than you need or less than you need.

And you need to find out how much sleep that you as an individual need, which is essentially, the amount that allows you to feel a wake, alert and high functioning during the day.

Jeff Mann: So yeah, I think to be fair, this was described as an observational study. And they didn't claim that there was any causation in this, but there's huge flaws with headlines like this because the obvious thing is that, you know, the people who are sleeping longer, maybe they're ill anyway, they're more inclined to, to sleep longer because the, their health isn't that well in the first place.

27:15 Neil Stanley: Yeah, I mean there is a cynical side to me, if you think about it, you know, you've got, we mentioned increased information coming out about sleep. But what is interesting is if you do scan the literature as I, do you find that it's quite strange that some articles from a journal, will get huge publicity and others don't.

And then you look behind it and of course you've got the university press office who are putting out really sexy press releases with headlines like *'Too much sleep can kill you'*.

And you know, I often look at journals and think, well that's a far more interesting article or paper, which would be of more benefit. But obviously the university hasn't bothered. You need headlines. I mean this is one of the things, the whole thing about universities now that they are a business, you need to get noticed.

Jeff Mann: The impact factor.

Neil Stanley: Yep. One of the things you get noticed on is how much press you get on your research. So you know, all these press releases have sort of key phrases in nowadays just to make it attractive. You know, the, the media, lift these press releases almost complete and just shove them in the paper. And so there's no critical thought to a newspaper. And one day they'll say, you know, sleeping nine hours is good for you. The next day you saying it will kill you and there's no responsibility.

28:50 Jeff Mann: Well exactly in our wake up on Monday and I'll read a headline, oh nine hours sleep can kill you. And then on Tuesday I'll read an article and it will say everyone needs nine hours sleep. And then on Wednesday I'll read an article and it will say, you know, less than seven and a half hours sleep can kill you.

You know, most people can't be bothered to go into the actual scientific report. They just read the headlines, you know, because that's the function of the media. But I find it really frustrating. But there is a responsibility, I think, for the media, for more critical thinking and to do this a bit better.

Neil Stanley: Yeah, I agree. The absolute advice, it's really not helped by extreme sensationalist headlines. All that's going to do is confuse people or make them feel that there is an issue where there isn't an issue.

And the problem is press releases from universities are designed to get media attention. Journalists love them because they can just lift them and publish them without any critical thought at all.

And in order to do that, you need to make them sexy. And if you do that, then you'll get that media. You talk about impact factor. You do these things and you get more research funding. It's a game that people play. but that it shouldn't be like, and as you say, nobody can go into these papers because 90 percent of all these papers, you have to pay and it's \$40 US dollars to read it for 24 hours.

That's just denying people the ability and therefore you do have to rely on the press release because you've got no way of questioning. And that I think is the problem with science.

I know that journals exist but many journals these days, are internet only, so the days of having to print copies and ship copies so has, has gone to just to download a pdf for 24 hours cannot cost \$40 US dollars in anybody's money but that's just keeping the information from, from the man in the street. And I don't think that's helpful.

Jeff Mann: Totally. And I think if anything, having this research in the public domain would encourage a lot more interesting research and multidisciplinary research. And as you say, it's not there. And if there was somebody who wasn't part of an institution and they just really wanted to investigate maybe two seemingly disparate topics about sleep and put them together, that they can't do it because they'd have to pay thousands of pounds for the access to the databases.

31:41 Neil Stanley: Yeah, absolutely. This, this is the problem that if you are going to make public health messaging, the information that you use for that must be in the public domain.

If you're doing something you obscure that isn't going to change the way people behave, then of course science has to be respected, but if you're going to use something like too much sleep can kill you. You have to make that the study you're basing that on free to view so people can judge what information you're giving them and the strength.

And the problem is we as a society just don't have that critical thinking because we're not allowed to because we're never given the information we never trusted to make the decisions ourselves.

Jeff Mann: Yeah. Hopefully in our own small way Neil, that's what we're doing with these podcasts.

Okay. I don't wanna talk too much about this study because it's quite, it's quite depressing, but there, there was an interesting thing about and this is kind of counter intuitive because the science of napping, napping is generally a good thing, but they found that people who napped in that ideal sleep duration bracket between 6-8 hour we're at a higher risk of mortality and cardiovascular problems, but the people who were below that and napped weren't at a high risk.

That just sounds weird, isn't it?

33:05 Neil Stanley: It does. And again the problem with this is - who are these people, as you mentioned earlier?

If you've got a nine till five day job and you've got kids you don't have time for napping. So if you do have time for napping, what is it about you that gives you that time?

And is that whatever it may be, the risk factor. And of course if you sleep less than you need, getting more sleep sued napping is of course going to be protective.

The problem is there is this perception, that big data is accurate data. If you have a million people then the answer must be true. But it's not It's, it's all about individuals. Is this important to me?

Should I be getting more sleep or should I be getting less sleep, not what the population averages. That's not useful to me.

Jeff Mann: Yeah. The were obsessed by big data and I totally agree.

Neil Stanley: The funniest, the funniest one of these was very recently actually in one of these big studies that said that you need to have exactly seven to eight hours sleep and it was a worldwide study. they claimed.

But one of the entry criteria was that it had to be done on a computer. You have to speak English. And so 95 percent of the people came from America and the UK. So these are people who have got a computer and who can be bothered to fill out a 20 minute survey. Self selecting.

And this is the problem to get good randomized data on individuals. And it's the individual that matters, not the whole population. Because if you, if you go for a population average, you are just average. And nobody is average. 49 point nine, nine percent of people who are above average, and 49 point nine, nine percent people are below average. There's nothing you can do about it.

35:10 Neil Stanley: I think it appeals to the general mindset that you see a figure. and this sort of magic bullet, it's hard to think about yourself as an individual, isn't it, because we're social creatures and we want to think, well, I'm just like everybody else.

So I need, you know, eight point two hours sleep, that's all I want to know, exactly what that number is ,and then I can measure it and then I know I'm okay. But the truth is we're all different. So these

studies here too much sleeping can kill you, well, what is too much sleep? Too much for one person is not the same for another person.

Absolutely.

35:42 Jeff Mann: Okay. Alright well the last one, I'll try and end on a bit of good news as it's been a bit doom and gloom. I think most of this sleep research tends to come from this doom and gloom angle and I'm very wary of it - this is going to kill you or you need to do that, or this can give you this disease, and sleep as a universal thing.

And as you've said before, it's a joyful thing and we should embrace it, and this bit of research is nice, especially coming up to Shristmas, a nice little ray of hope and it's to do with teenagers, adolescents and this whole [Start School Later movement](#), which if anyone's unaware, it's been going on in the States, a grassroots campaigns for over 20 years, trying to shift school start times later.

Because in the UK were quite sensible really. Our schools start about 9:00, but in the States, because of the way the school bus system works and all that, sometimes the schools start at 7:00 in the morning, which is way, way too early for teenagers.

Because teenagers need, their body clocks are shifted so they need to actually be starting later. So there's been this big movement to move school start times later. And so they did a study in Seattle across schools in Seattle, where they actually did make this change in 2017.

So had they had an opportunity to monitor students before the change was made, when the school times were really early, I think it was 7:50am in the morning and then they monitored them when they're going to school that time.

And then they monitored them in 2017 a year later when school times at were 8:45am.

And surprise, surprise, they got more sleep. It was on average 34 minutes more sleep. They also found that attendance improved and also the median test scores went up as well. So for people who've been campaigning in this area, you know, it's, it's a bit of good news.

It's like again, it's like, well, 'I told you so' kind of moment, you know, we moved the school times and the kids grades are getting up, the attendance is improving and they're getting more sleep.

38:00 Neil Stanley: This movement has been going on, studies came out in 1976 about later school start times and you know the information the evidence is compelling. This is a perfect example of that.

What is absolutely scary though, is that there are school boards in America that are actually either not moving or actually some schools in Texas last year that actually moved times school start times earlier, and this is, this is the unbelievable thing.

You know, we, we've talked throughout this podcast, we made good, applicable evidence good applicable data to the man in the street. And this is an ideal example of that.

Everything, you know, behavior, attendance, academic performance, athletic performance. Teachers, reports of behavior, adult reports of behavior, everybody is happier, healthier and doing better if you have later school start times, but that is not convincing enough for some people.

In the midterm elections in California, there was a referendum item on putting the school start times later, which was passed by the populous but the governor to sign it.

Jeff Mann: It was so close. It was, I was following her and I, I'm not really that aware of the American, um, sort of voting system. And I was cheering. Yeah, yeah. They pushed it through the and then the governor vetoed by the last minute.

39:39 Neil Stanley: Yeah. On no earthly basis. He didn't make a scientific argument about it. He didn't make an economic argument as to why it couldn't happen. He just refused to do it.

You know, how you can be so blind in the face of such compelling evidence and you know, in a way, even if even if the effect was not as big as some of these studies site it's like, why not try, you know, what have you got to lose, there is no negative aspect to starting school later.

You know, people, people always say, you know, why do school start so early? Well, you know, half the time it's so the bus school buses can get you there and back before the traffic jams. Well that's not a good enough reason to screw your children's education. The idea that teachers want to go home early seems to be prevalent, but I've never really met a teacher who is that motivated by an early afternoon.

So there is no counter argument that's the thing that gets me. You can't make an argument as to why you shouldn't put school start times later. And to be honest, you know, every school in the land could decide that after Christmas, they could start an hour later. It wouldn't make any difference to anybody except for the children.

41:04 Jeff Mann: Well totally. It's all in the interest of the children during this. And I interviewed [Marco Hafner from RAND](#). He actually did, his team did a big study on this. He did this famous study on the economics of sleep, but they also did one about the economic impact of shifting school start times later.

And we talked about this, but his general view, very broad view is that it's purely financial. And the reason is the schools have one fleet of buses and so what they do is they, the bus drivers probably get up at four in the morning, or whatever. And then they go and do the first round to pick up the kids who live furthest away. And sometimes this is like 5.20 in the morning and they pick up the oldest kids first. And so they pickup, the oldest kids at half five in the morning, drop them off at school and then circle back for the younger ones, you know, cause I don't want to have the young kids at school have such an early time.

But that's the worst thing you can do. It's the older kids that need the most sleep. So it's like the equivalent of us getting up at three in the morning and you're picking these kids up. And the only reason they're doing it is because they just have one fleet of buses and, and they want to, okay, you know, save money by just having this bus, doing a loop and a loop and a loop. And none of it is in the interest of the kids. This is all about saving money.

42:30 Neil Stanley: What's the point of education if it's not to help children? If you said -I don't know how much a school bus in America cost \$100,000? If you said to a school, most schools in the States have a whip round to buy another bus and that means your children's grades will improve by one grade simply because they're going to school later, I think some of them would put their hand in the pocket, If it was put it in those terms, that the reason we're screwing your children's education is because we can't afford another bus. I think people would buy buses.

And I think this, this is the false economy that we want our children to do well and yet we are actively conspiring against them for no good earthly reason. Um, and I just think that's crazy.

43:34 Jeff Mann: Logically, it makes no sense. So it can only be some other interest, financial interests or whatever. They're saying, no, we don't want to do this because the kids get more sleep, their health is better, their grades increase, their attendance goes up, and if you measure that over the

long term, then that's more money coming into the economy because you've got better qualified, healthier kids.

Neil Stanley: Yeah, I mean there is research that shows that children who are sleepy will drop out of school earlier and also it will actually affect their ability to become employed they will earn less across the lifetime and so, you know, it wouldn't take a genius to put the two figures together and compare the cost of, you know, bussing them in at a different time compared to the cost to society overall.

I think, the upfront cost would be infinitesimally small in comparison, but of course it's an obvious pay now cost rather than a long term societal thing. But that's what politicians and therefore politicians aren't meant to be businessmen. They're not worried about the bottom line initially. They're worried about what's good for the citizen and the data is so so conclusive.

This is what I don't understand, you can't argue with the data, so why would you not go with it.

45:06 Jeff Mann: Anyway. Even though, I'm having a bit of a rant and a bit of a moan, this is a bit of great news because it is evidence that just shows that when kids start school later, everything improves and on a Christmas note. I want to leave with that bit of good news.

I'm going to leave it at that Neil. I'm brilliant. Thanks so much for your input. And let's do this, let's kick this off again in the New Year because I'm, I'm sure there's going to be even more of a deluge of studies to talk about. Awesome. Well, have a great holiday season Neil. Thanks very much and I'll speak to you in January. Take care. Bye.