

# Looking for a sound future?

Did you know that noise poses a serious health hazard, and that many people underestimate how much buildings truly affect our wellbeing? These effects are only increased through the rapidly increasing urbanisation that brings infrastructure and domestic buildings closer together.

The good news is that noise pollution can be managed and controlled with the right solutions put in place.

In this issue of ROCKInsights you will learn more about the impact of noise on your daily life, and how to protect yourself from the impact of noise pollution.



**ROCKWOOL®**

At ROCKWOOL we are taking this seriously and want to share with you the four articles below, all related to noise.

The articles will offer you the following insights:

**The truth about noise**, in this article we touch upon how and why noise is a problem, what we know about noise, and not least the difference between sound and noise.

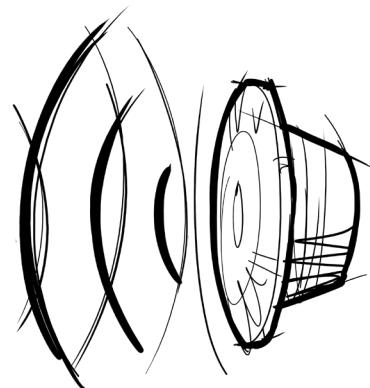
**The dangers of noise pollution**, here we go into details about how noise affects people, how it is a common drawback of increased urbanisation and thus becoming more prevalent.

**Preventing exposure to noise**, in this article we look closer at how there is an increased awareness towards younger people being exposed to noise and the more long-term effects on their health.

**Effective noise control strategies**, in this final article we change our focus to how to deal with noise pollution, and look into smarter ways and strategies to curb the harmful impacts of noise.

In each of the four articles we deep dive on the specific challenges and come up with our best insights on how to mitigate them.

To ease your access to this important information, and to focus your reading, we have created this edition of ROCKInsights that we think you will find interesting.



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# The truth about noise

Alessandro Bracco

## How is it a problem?

It's no secret that noise is a bad thing. It can make us feel uncomfortable and annoyed, and it can even be detrimental to our health.

But how much do we really know about noise and the problems it poses? For example, do you know the difference between sound and noise?

Existing as a pressure wave that is created from vibrations in the environment or an object, a sound can be anything that is perceived by the human ear. As an integral part of our lives, sound comes in various forms — whether it is the singing of birds or the cascading of water — and is not necessarily just one specific vibration or frequency<sup>1</sup>.

Noise, on the other hand, is simply unwanted sound<sup>2</sup>. Reactions to noise can be a complicated affair, as there is no physical distinction between sound and noise. This makes noise highly contextual, and is affected by different characteristics such as volume, frequency, and pitch, as well as how much control we have over it.

This could explain how a fan of heavy metal might enjoy the music while someone else might find it unbearable, or why the pleasant melody of

wind blowing through the trees could become bothersome when it prevents you from clearly understanding the person you are having a conversation with.

In other words, a single sound could be either noise or not noise depending on what you want to hear. This is referred to as listener intent.

### What is noise?

Imagine this: You are watching TV when someone comes up and starts talking to you. Which is the noise — the sound from the TV or the person's voice? It all depends on what you want to hear. Listener intent helps you focus your attention on your desired sound while reducing background noise<sup>3</sup>.

However, loud noise can still be overwhelming, and becomes particularly problematic when it disturbs important activities such as sleep, learning, and work.

The World Health Organization (WHO) recommends less than 30 A-weighted decibels (dB(A)) of noise in bedrooms and less than 40dB(A) outside of bedrooms for good quality sleep.

A-weighted decibels is a system of measuring sound levels with the same sensitivity to different frequencies as the average human ear<sup>4</sup>. For reference, a person whispering in a quiet room is approximately 25dB(A)<sup>5</sup>.

### **Noise can affect your health**

Exposure to noise levels above 40dB at night can result in sleep disturbance and awakenings. Good quality sleep is important for ensuring that our brain functions well during the day. It also plays a critical role in allowing our bodies to repair and recover themselves from a tough day's work, in order to continue performing at peak condition. Therefore, sleep disturbance could lead to adverse effects to the human body.

For example, it could impact the hormonal changes that regulate our glucose levels as we sleep, which would lead to reduced glucose tolerance and increase the risk of type 2 diabetes<sup>6</sup>. What's more, people experiencing interrupted sleep may find themselves at greater risk of depression, putting a strain on their mental health<sup>7</sup>. At noise levels above 55dB, elevated blood pressure and ischaemic heart disease may occur<sup>8</sup>, which can ultimately lead to heart attacks.

**If you are interested in reading more about how noise can cause sleep disturbances and how it affects your body, check out this article!**

In fact, a WHO study discovered that at least one million healthy life years are lost every year in Western Europe as result of exposure to environmental noise<sup>9</sup>. This positions noise as the second largest environmental cause of ill health, after air pollution<sup>10</sup>. On top of that, a UK study showed that exposure to noise above the recommended levels resulted in an additional 1169 cases of dementia, 788 cases of stroke, and 542 cases of heart attack in a single year<sup>11</sup>.

**The World Health Organization (WHO) recommends less than**

# **30 dBA**

of noise in bedrooms

### **Loud classrooms can hamper learning**

Children in schools aren't off the hook as noise can pose a negative impact in educational settings too. For example, studies have shown that children miss 25 percent of the words spoken by their teachers as a consequence of a noisy classroom<sup>12</sup>.

In addition, a two month reading delay can be observed in British and Dutch primary school children due to an increase in transport noise of 5dB<sup>13</sup>. According to a German study, children may also experience hyperactivity, inattention, and emotional problems as a consequence of elevated noise levels<sup>11</sup>.

The WHO recommends a noise level of less than 35dB(A) in classrooms in order to support optimal teaching and learning conditions. This is significantly lower than in many urban locations.

### **So, how can we deal with the problem that is noise?**

Although earplugs and noise-cancelling headphones can help reduce your exposure to noise, you wouldn't necessarily want to have your ears blocked all the time. Conversely, good building design plays a crucial role in addressing the noise issue without impairing your physical comfort.

For example, the use of soundproof walls and acoustic tiles, along with measures such as quiet rooms, can significantly reduce unwanted noise and contribute to quieter, peaceful, and more restful environments.

Remarkably, stone wool products can be engineered to isolate and control vibrations and noise. This means that they make excellent insulation and acoustics tiles, thanks to their noise reduction and sound absorption qualities, which can quieten even the noisiest infrastructure sounds.

Ultimately, the world is teeming with noise. Knowing how to identify it, and learning how to overcome it, can help open the doors to a better quality of life.

## Hungry for more?

### The key to a stress-free home

Want a stress-free home? 

Quality construction certainly helps.

### Acoustics: what you need to hear

Students all over the world are having trouble hearing their teachers, but there is a solution. 

### Improve your business with good office acoustics

Find out how you can create a happier and more productive workplace environment. 

### Noise and sleep disturbance

Find out what a bad night's sleep does to your body, and how you can remedy it. 

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# The dangers of noise pollution

Jan Simonsen

## It's worse than you think.

### What are your ears hearing right now?

Is it the bustling sounds of a busy office? Or maybe the commotion of vehicles in heavy traffic? Perhaps it's the crying of babies in prams. Whatever it is, one thing is certain — it makes people feel awful. After all, noise pollution is still pollution. And even as other forms of pollution decrease, noise pollution is becoming more prevalent<sup>1</sup>.

In fact, you've probably been guilty of noise pollution too — whether it's blaring music from your phone or talking just a little too loudly.

Noise is actually a common drawback of urban life. And the world is becoming more and more urbanised each day, with three million people a week moving to urban environments<sup>1</sup>. In the UK alone, cities take up 8% of the land whilst accounting for 54% of the population, 60% of jobs and 62% of all exports<sup>2</sup>.

As cities get larger and urban populations grow, the problem of noise pollution will only get worse. This stems from people and buildings being packed closer together, along with an increase in transit and industrial activity.

The thing is, noise pollution poses a threat to both our health as well as the attractiveness of a city.

Notable health issues that can be caused by noise pollution include stress, weakened mental acuity, and elevated blood pressure and heart rates. These issues could even lead to more serious problems. In fact, noise pollution has been linked to other dire health complications such as dementia, stroke, and heart attack<sup>3</sup>.

Therefore, a noisy environment may deter people from relocating to such a place<sup>4</sup>, and even encourage people already living there to move to somewhere less taxing on their body and mind. London, in particular, is a city that has suffered diminished appeal due to noise pollution.

### Noise pollution in megacities

Whilst London enjoys a reputation as the world's number one preferred relocation destination for professionals and the globe's most popular city for those considering working abroad<sup>5</sup>, research published in January 2017 also revealed that constant noise is one of the main reasons given by Londoners for moving out of the city, with 41% citing it as a reason for leaving<sup>6</sup>.

The National Noise Attitude Survey showed that between 2000 and 2012, noise increased from being the ninth environmental priority to the fourth, with 48% of the public feeling that their home life was spoilt by noise.

### Sources of noise pollution

According to an analysis, conducted over the period April 2007 to March 2008, by the Westminster City Council in central London, the top five reasons for noise complaints were as follows:

1. Residential noise (i.e. neighbours)
2. Noise from commercial premises
3. Building site
4. Noise in the street
5. Burglar alarm

What's more, these noise complaints generally peaked between 8pm and midnight, on Fridays, Saturdays and Sundays. This means that noise pollution has a large impact on people who are likely at home and trying to sleep in the evenings or trying to relax during the weekends.

Find out what a bad night's sleep does to your body, and how you can remedy it.

The truth is, London has the highest rate of noise complaints than any other region in England by a considerable margin, at 16.8 per thousand population (all other English regions have a rate between 4.2 and 6.7).

**Surveys have showed that**

**48%**

of the public feel that their home life was spoilt by noise

Furthermore, 2.4 million people (25% of the population) in the Greater London Urban Area (including parts of adjacent districts) are exposed to noise levels equal to or over 55 decibels (dB) from road traffic alone<sup>7</sup>. This is equivalent to the noise of a loud conversation, which the WHO defines "as a noise level that can cause health problems for a community"<sup>8</sup>. In fact, research has shown that those surrounded by daytime traffic noise louder than 60dB are 4 percent more likely to die than those who only experienced noise levels below 55dB<sup>9</sup>.

In the face of these overwhelming numbers, the reality is much more alarming. Based on research conducted on 50 different cities around the globe, London ranks only as the 24<sup>th</sup> noisiest city<sup>10</sup>. This means that there are many parts of the world that are dealing with even worse cases of noise pollution than the aforementioned dilemma in London.

Guangzhou tops the list as the worst city for noise pollution. Delhi comes in second worst, followed by Cairo, Mumbai, Istanbul, and Beijing. Barcelona, one of only two European cities to feature in the worst ten, came seventh, while capital cities Mexico City, Paris and Buenos Aires cam in at eighth, ninth, and tenth position respectively<sup>10</sup>.

In addition, reports show that there is a 64% positive correlation between noise pollution in cities and hearing loss. As the second worst city for noise pollution, Delhi has the most severe cases of hearing loss. On average, the residents of Delhi have hearing loss equivalent to people almost 20 years older than their actual age<sup>11</sup>.

Want to learn how we can change the relationship between noise and public spaces? Check out this article!

The perils of noise pollution are well documented. Regardless of whether or not you are fazed by the statistics, the message is clear: we need to be more aware of the impact of noise pollution, and protect ourselves from its negative effects.

We can start with exploring new acoustic materials, such as stone wool products, that can help shield us from loud, unwanted noise when we are indoors. We can also speak to our neighbours and our fellow people about reducing noise pollution, both at an individual as well as industry and infrastructure level. After all, we all have a part to play if we want to save ourselves from noise pollution's deadly grasp.

## Hungry for more?

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### **The truth about noise**

It's no secret that noise is a bad thing. It can make us feel uncomfortable and annoyed, and it can even be detrimental to our health.



### **Rethinking Noise In Public Spaces**

How noise pollution affects our health and well-being.



### **Celebrate Noise Awareness Day:**

#### **7 Ways To Protect Your Hearing**

International Noise Awareness Day is on April 24<sup>th</sup>. Here are tips to help save your hearing and more. Living your healthiest happiest life depends on it.



### **Improve your business with good office acoustics**

Find out how you can create a happier and more productive workplace environment.



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# Preventing exposure to noise

Alessandro Bracco

**Learn how there is a new awareness towards younger people who are exposed to environmental noise.**

## Bodily health

We generally believe that our health is affected by two main factors: exercise and diet. However, are you aware that there are cardiovascular effects that can come from environmental noise? That's right, even the busy, noisy world around you is contributing directly to your bodily health.

Everyone is concerned about health. Regardless of whether someone runs 10 miles a day or hasn't seen a doctor in 10 years, friends and family are always cautioning one another to live a healthier life.

Nevertheless, the critical key to this healthier lifestyle could be in the form of an unexpected source: Buildings.

## Noise pollution

Findings have shown that noise pollution can contribute to poor health, namely in children, in the form of paediatric pre hypertension (pre-HTN). A way to combat these outside threats is to implement buildings that can block out these forms of pollution.

Despite our knowledge regarding risk prevention, **deep building renovations** are becoming the go to solution. The use of the right materials and techniques - within an updated dwelling design - puts adults and children alike out of harm's way.

With a continuously moving environment surrounding us, adapting our homes and businesses can prevent the spread of risks to those who live and work within these buildings. Whether it comes via **insulation implementation** or sound absorbing products, overcoming the issues you have with potential threats to your health becomes easily doable through a well-thought design process.

In the past, the risks of noise pollution were not widely known, and they were never thought to have long term harmful effects on human beings. But recent discoveries have shown that environmental factors have a direct connection to increasing levels of paediatric pre HTN. Child health being a priority for our society, this is a serious matter to consider.

When deciding the best course of action, take a look at the ways in which you can stop noise pollution from entering your home or business. You will find that the benefits of a deep renovation will help cancel out threats of pollution.

Furthermore, stopping these negative factors from getting inside will keep your personal space pollution free for the good of yourself and your little ones.

The most important rule in health is to always be aware of what is going into your body and your immediate environment. Rather than being on constant alert for noise pollution, take charge of the situation through smart usage of the design of your home and the materials within it. Thorough prevention of noise pollution may end up saving you a visit to the doctor.

## Hungry for more?

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### **Acoustics: what you need to hear**

Students all over the world are having trouble hearing their teachers, but there is a solution. 

### **Rock solid resourcing**

Stone is reproduced naturally by the Earth, making it a strong bet for the future. 

### **Putting circularity into our world**

Waste can be either managed or eliminated; find out how circularity is doing both with stone wool. 

### **Climate change is here; time to limit its effects**

The world around us is changing, meaning we must change with it to prevail in our efforts to consume less energy. 

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#### **Source(s):**

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# Effective noise control strategies

Jan Simonsen

## Discover ways to curb the harmful impact of noise.

For something we can't see, noise pollution does a staggering and irreparable amount of damage to both our physical and mental health. In fact, the World Health Organization has dubbed environmental noise pollution an "underestimated threat"<sup>1</sup>.

Research has shown that exposure to high levels of noise can result in physical complications such as debilitating heart attacks, stroke<sup>2</sup>, and diabetes<sup>3</sup>. At the same time, noise pollution also puts a strain on our mental state, which can lead to headaches, depression<sup>4</sup>, and accidents from weariness<sup>5</sup>.

And yet, this invisible threat shows no signs of slowing down. Noise from urbanisation and population are growing. New vehicles are coming up with louder and louder horns. Meanwhile, research has shown that both people and birds are louder when they live in the city, as compared to their country counterparts, in order to stand out from the din of urban life<sup>6</sup>.

Therefore, we need to be more aware about noisy environments, and be smarter about the ways that we deal with noise. This will help us implement more effective sound control solutions and avoid the harmful effects of noise.

### Strategies to reduce noise pollution

One of the key strategies to reducing the adverse effects of noise pollution is to plan and design buildings around the objective of effective noise control. For instance in the UK, this is reinforced by a number of initiatives, including the guidance on noise from the Department for Communities and Local Government (DCLG)<sup>7</sup>, the Ambient Noise Strategy titled "Sounder City" from the Mayor of London<sup>8</sup>, the Mayor's Sustainable Design and Construction Supplementary Planning Guidance<sup>9</sup>, and the Mayor's Housing Supplementary Planning Guidance<sup>10</sup>.

These plans detail the mitigation of noise pollution's negative effects by designing buildings in a manner that minimises exposure to noise, and making use of acoustic insulation.

Stone wool products can play an important role in supporting these efforts. This is because high-density stone wool has proven acoustic capabilities that allow it to isolate and control vibrations, thus efficiently absorbing sound and reducing noise. Such insulation can provide invaluable solutions at transport sites and entertainment venues, both of which are significant sources of noise.

Common noise barriers come in the form of weather stripping (which stone wool can be used for) and double-paned windows, especially if you live in a noisy city or near an airport. As an added bonus, applying these changes to a building can also reduce heating and cooling bills, and help protect the environment from harmful carbon emissions.

For example, the Transport Strategy published in 2010 notes that a fifth of Londoners are annoyed or disturbed by noise in their homes and that the most disturbing noise is created by buses and lorries. The Transport Strategy suggests that putting noise barriers in place in some areas, along with reviewing sound insulation regulations, may be a solution. What's more, it adds that all new projects will consider noise mitigation measures<sup>11</sup>.

If you are unable to eliminate unpleasant noise from your surroundings, you can actually create a healthier environment by replacing stress-inducing environmental sounds with more pleasing ones.

For example, you can make use of a white noise machine or a sound spa — which play sounds ranging from waterfalls to rain, babbling brooks, and even basic static. These sounds can help to drown out jarring environmental noises that can distract you or disturb your sleep, in turn achieving a soothing effect. Playing music that you enjoy can also accomplish a similar result, while improving your mood.

Doing this may feel like you are simply trading in some sounds for others, but the sounds of nature and music can feel more relaxing, and therefore

better for your health. After all, sounds become noise depending on what you actually want to hear.

### **Environmental noise control**

There are also other strategies in place to deal with noise. Noise maps are created every five years (2007 and 2012) to align action plans with the Environmental Noise Directive<sup>12</sup>. Simultaneously, good environmental noise quality is preserved by identifying Quiet Areas, while the public is educated on environmental noise and its effects in order to promote more considerate behaviour in relation to noise<sup>13</sup>.

Hence, another way of reducing the impact of noise if you are unable to eliminate it, is to create distance between yourself and the source of the noise. At the same time, if you are the source of the noise, it is common courtesy to avoid doing it close to other people. For example, you can step outside to take a phone call during work, instead of broadcasting it to the entire office.

There are even existing mobile applications (such as SoundPrint, iHEARu, and Hush City) that give you the ability to rate the sound levels of different venues, as well as discover quiet places in a neighbourhood. This provides better assistance for people who are struggling to find a tranquil place to spend their time.

Ultimately, we need to continue discovering and implementing new and innovative ways to limit the negative impact of noise pollution, so that we can raise our efforts in the war on noise and safeguard our health and happiness.

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#### **Source(s):**

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Summing this issue of ROCKInsights, we have covered several topics stretching from what noise really is, what it does to you, and some effective strategies on how to prevent noise pollution.

**In the first article**, we learned that people's ears differ and thus noise is a matter of unwanted sound. Also, that exposure to noise levels above 40dB at night can result in sleep disturbances and awakenings that again may lead to adverse effects in the human body.

**In the second article**, we saw how noise pollution can cause health issues including hearing loss, stress, weakened mental health, elevated blood pressure and heart rates.

**In the third article**, we moved on to look at how to prevent noise pollution. One way is to look at ways in which you can stop noise pollution from entering your home or business. The use of the right materials and techniques - within an updated dwelling design will help put adults and children alike out of harm's way.

**In the fourth and last article**, focus was on additional noise control strategies. Here, we touched upon e.g. using noise maps and distancing yourself from noise sources that you cannot eliminate. Another efficient way to reduce noise pollution is to plan and design buildings around the objective of effective noise control and here stone wool products can play an important role in supporting these efforts.

Having read through this issue of ROCKInsights it is clear that noise pollution is dangerous for us humans. The good news, however, is that there are ways to limit exposure and cope with noise pollution.



### If you have any comments or inputs for us

– including topics for future editions of ROCKInsights please contact us.

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