

Assessing the impact of Covid-19 lockdown on water safety

Spencer Culley, managing director of Churchill Environmental, explores the impact of building closures on water safety and quality as a result of the various lockdowns.

Background

For the first time for many of us in our working lives, we have seen forced building closures overnight and reduced occupancy levels across the nation. As a result, many organisations still feel uncertain on how best to safely manage their key building assets (especially the hot and cold water systems) during this unprecedented scenario.

To provide some context, most of our building hot and cold (and other) water systems were designed in accordance with BS 8558:2015, meaning that nearly all of them have been designed and installed to provide a continuous supply for the maximum occupancy levels of that particular building. In addition, they were designed to be utilised regularly (on a daily basis).

In fact, one of the main factors designers and installers are required to consider as part of BS 8558, states:

“the estimated daily consumption and the maximum and average flow rates required, together with the estimated time of peak flow...”

With these closures continuing and likely to be something we have to manage for some time, the impact on general water safety and water quality will be significant, largely due to infrequent or no use of these water systems. To compound the severity of these problematic circumstances, instances of underusage coincided with the increased susceptibility to infection of a significant portion of the general population (i.e. those who have recovered from Covid-19), could lead to sporadic outbreaks of legionellosis or other water related infections or illnesses.

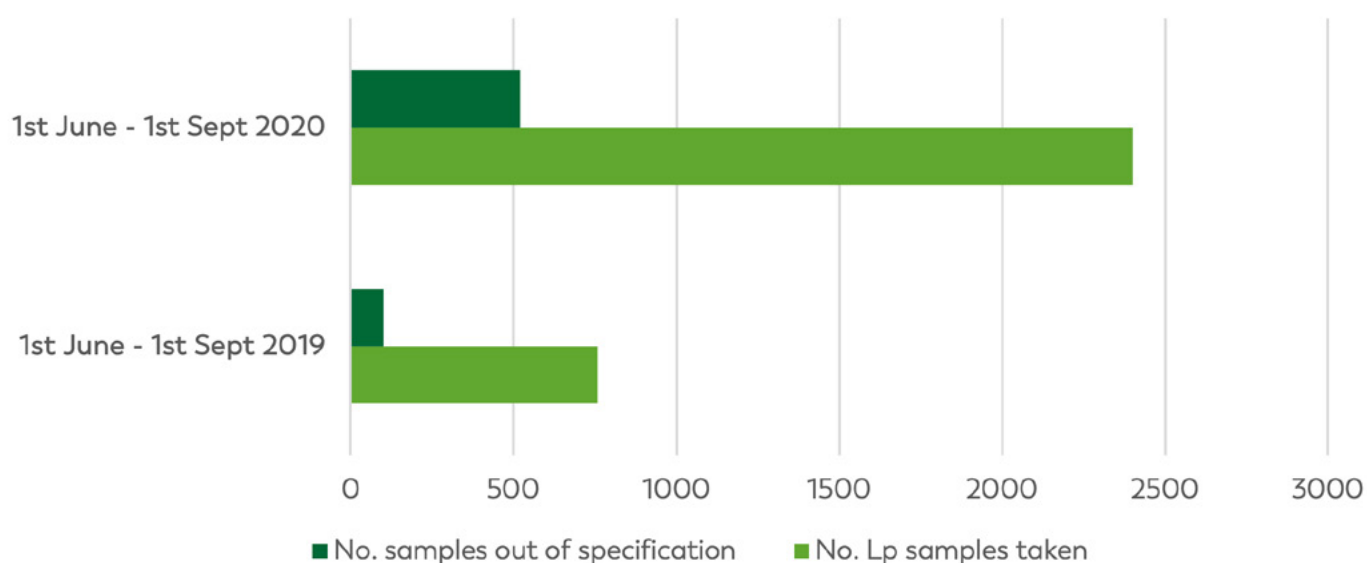
Since the lockdown started, the Health and Safety Executive (HSE), industry experts, and relevant trade associations have been warning of the potential for unmanaged water systems to become colonised with bacteria, as well as creating other potentially detrimental issues, including temperature changes and mechanical deterioration of the system materials, to name a few. All of them have expressed the critical need to implement a comprehensive flushing regime (to mimic normal operational use), followed by a recommissioning disinfection prior to reopening, or even a full closure and prohibition of the water system with a carefully managed residual disinfection to remove the biocide left in the system.

What the data tells us

Alas, the nature and speed of the lockdown meant these warnings went unheeded by many, and we are only now beginning to see the effects of this in our sampling results across all sectors and building types.

From recent data analysis of samples taken for legionella bacteria across hot and cold water systems in a variety of buildings (schools, retail outlets, offices, factories and even communal areas in sheltered housing schemes), we have seen an alarming and clear increase in the number of failures.

No. of out of specification legionella sample results



*All samples taken in accordance with BS 8554:2015 & analysed at a UKAS accredited laboratory. In this case, 'out of specification' defined as >100 cfu/litre

This increase from a 13% failure rate between June-September 2019, to 22% for the same period in 2020 could very well be attributed to the stagnation of water systems due to underusage during lockdown. We may also be seeing the impact of the recent warm weather conditions during the period in 2020, as a causative factor.

Unfortunately, the first outbreak since lockdown has been identified in West Bromwich in September. Six people were diagnosed with Legionnaires' disease with the HSE still investigating the source of the infection. We have also seen a number of high profile building closures following water sample failures and we expect this to continue to rise.

Should these results concern us?

Given the potential for increased susceptibility of some building occupants returning to work having recovered from Covid-19, yes, they should. A recent study in the Lancet concluded that as previous coronavirus outbreaks have been associated with substantial post-viral (pulmonary) fibrosis and physiological impairment, close follow-up and monitoring of recovered Covid-19 patients is essential, meaning these patients are more prone to infection as a result of legionellosis and Legionnaires' disease.

The impact of water system stagnation

Furthermore, we also need to be wary of the potential long-term impact of water system stagnation and likely formation of biofilm, a complex collective of a variety of microorganisms including bacteria. Biofilm formation begins when free-floating microorganisms such as bacteria, come in contact with an appropriate surface and begin to put down 'roots', subsequently starting to produce a glue-like substance known as an extracellular polymeric substance (EPS).

EPS acts as both a food source and safe haven by effectively creating its own protective shield. Over just a small period of time, more layers of microorganisms are added, creating a complex structure which eventually either bursts open or breaks away to leave the fold and establish on a new surface, eventually leading to systemwide colonisation.

This process is known as seeding dispersal and has been known to contaminate water systems for months, sometimes years. It can be extremely difficult to remove even with regular disinfections. In many cases, the introduction of continuous water treatment is the only effective way to control such a colonised system.

Changing our approach to water safety management

As we move forward, more people may be working from home with the possibility of reduced occupancy levels in buildings and offices on a long-term basis. As a result, we will need to reconsider our overall approach to our water management and account for future forced or planned building closures, as we suspect this pandemic will not be the last.

The HSE, Legionella Control Association and other industry bodies have requested for organisations to take account of these changes in circumstances and urgently seek to **formally** review their water hygiene and legionella risk assessments. This will require a specialist assessor reviewing each organisation's previous arrangements and determining the impact of lockdown on the overall use of the water systems, all related assets, susceptibility of occupants and the new potential for contamination. Consequently, many assessors and specialist consultants are now advocating supplementary water sampling regimes as a backstop to ensure controls are effective.

In addition to the risk reviews, Water Safety Plans (WSP) will need to be created and implemented. These plans should contain comprehensive details on how to shift from our normal operating procedures to a set of predetermined procedures for effective water system management during future periods of full or partial building closures.

We must see recent events as an opportunity to undertake a robust gap analysis assessments and start to prepare our WSPs in line with the British Standard.

Fortunately, help is at hand!

The recent publication of BS 8680:2020 Water quality. Water safety plans. Code of practice outlines the requirement for all organisations to have a comprehensive water safety plan in place. The document provides industry specialists and building and facilities managers with a detailed scope of how to construct and manage a WSP with useful guidance on the plan format for organisations of all sizes.

About Churchill Environmental

Churchill Environmental delivers a full range of environmental compliance services including water treatment and Legionella control. Our expert teams will work with you to recommend and implement the best disinfection and sampling regimes for your water systems to protect the health and safety of your returning building occupants.



Useful guidance

> [Drinking Water Inspectorate](#)

> [Legionella Control Association](#)