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## Introduction

Waterborne viruses represent hundreds of millions of infections per year worldwide. Major sources of contaminations are notably consumption of unwashed-uncooked vegetables-fruits which were sullied by irrigation with contaminated water. American authorities recently stipulated that stopping irrigation with contaminated water three days before harvest would prevent most waterborne virus spread. Together, there is a need for determining if irrigation water contains dangerous viruses. For such purposes ABL developed a kit “all-in-one” designed to perform remote virological water testing, not requiring any specific lab equipment for sample preparation, the analysis results can be generated by a portable qPCR thermocycler.

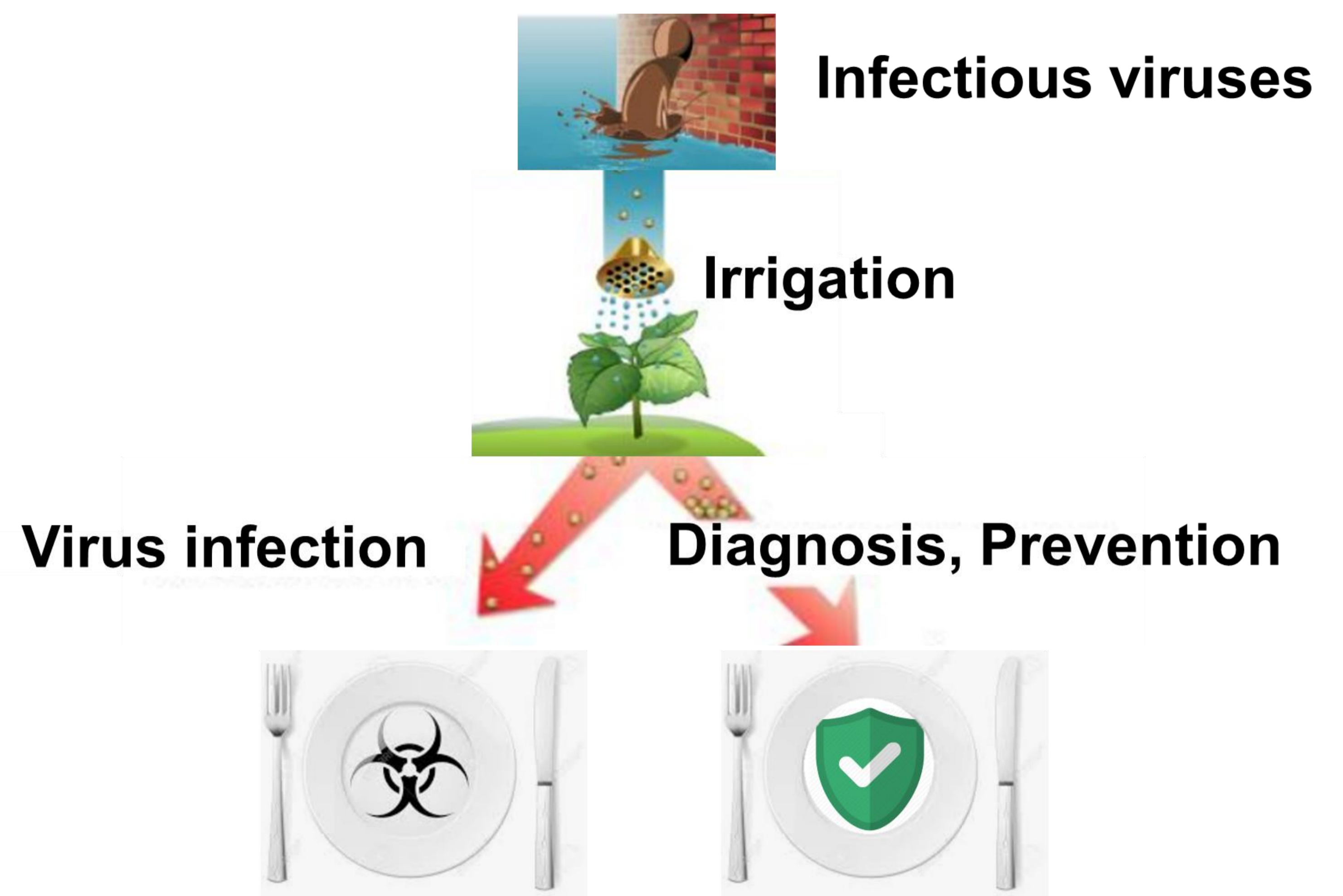


Figure 1: Pathway of Waterborne Viruses

## Methods

Per sample, 25 mL of wastewater was added to a chemical containing sterile syringe. After chemicals dissolution, extracted nucleic acids including viral genomes were collected onto silica covered magnetic beads. The beads were then washed twice with alcohol containing solutions to remove potential PCR inhibitors. Waterborne viruses' detection was then performed using ABL Ultragene® qPCR screening assay kits with qPCR instrument.

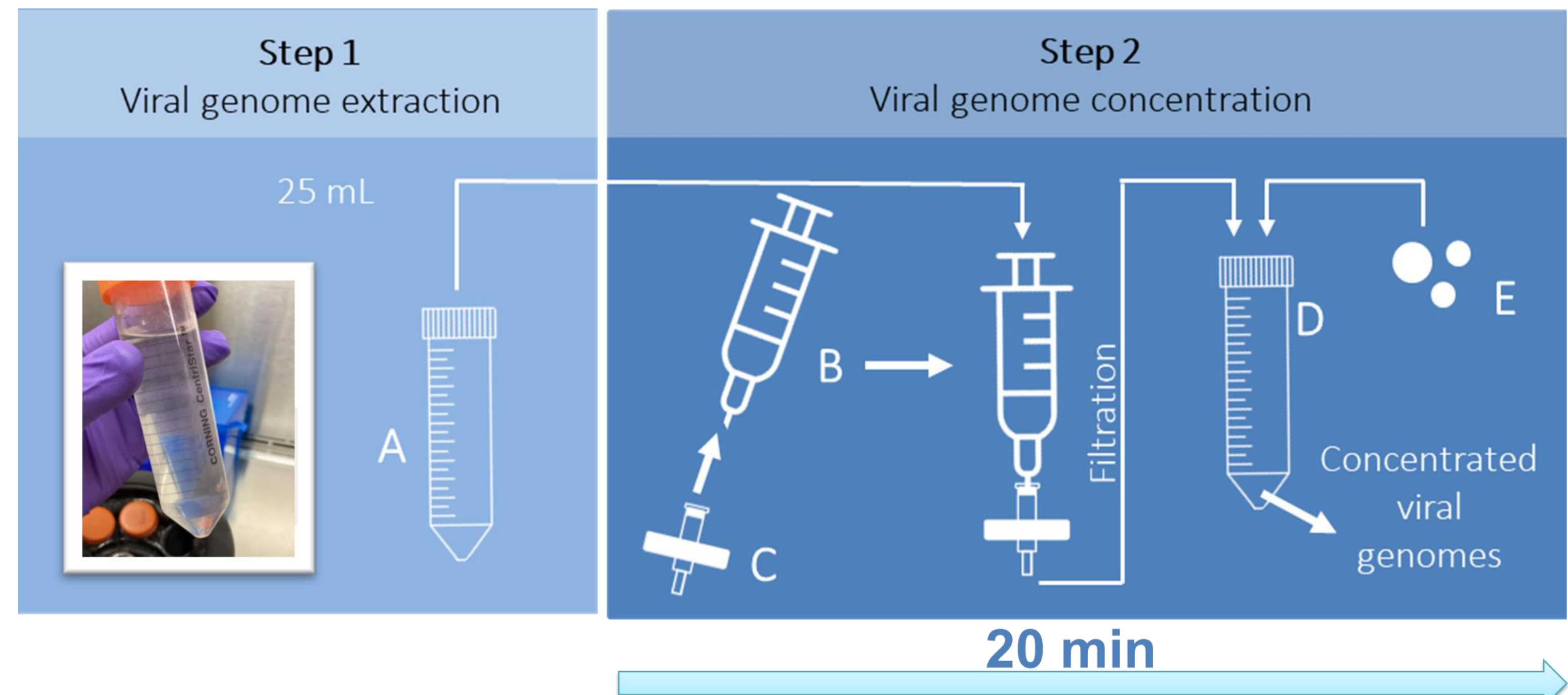


Figure 2: Diagnosis workflow

## Results

- The water transmitted viral pathogen collection kit developed by ABL provided repeatable detection of Norovirus GII.4, Rotavirus A, Adenoviruses, Enteroviruses, Hepatitis virus E and SARS-CoV-2 from wastewater samples, without using any specific lab equipment beside thermocycler for qPCR.
- The sensitivity was similar as the one obtained with automation. Only 20 minutes hands on work were necessary with a facilitated workflow.

## Conclusions

This ABL made water transmitted viral pathogen collection kit provides a unique standardized solution for virological remote water testing, and microbial analysis by NGS sequencing of RNA 16 & 18 S.