

UNDERSTANDING WHY INFORMAL HOMES IGNITE AND FIRES SPREAD



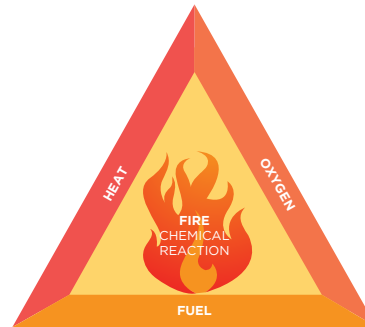
CREATING FIRE SAFE HOMES

There is no one-size-fits-all method, material or gadget to make informal settlements and backyard dwellings fire safe. Understanding how fire behaves, how homes ignite, what makes an area high risk and what happens during an incident will help you make communities safer.

To access fire safety training material: videos and brochures (bit.ly/3ENVYUn) and guide book (<http://hdl.handle.net/10019.1/108926>)

THE FIRE TRIANGLE

For a fire to burn there are a number of components required, which are normally illustrated with the fire triangle. Taking any of these components away will stop the fire:



HEAT

Any liquid or solid fuel (e.g. your bed) needs heat to convert it into a gas so that it can ignite. Cooling a fire with water prevents this.

OXYGEN

Stopping air from getting to a fire, such as smothering it with a blanket, prevents the fire from burning.

FUEL

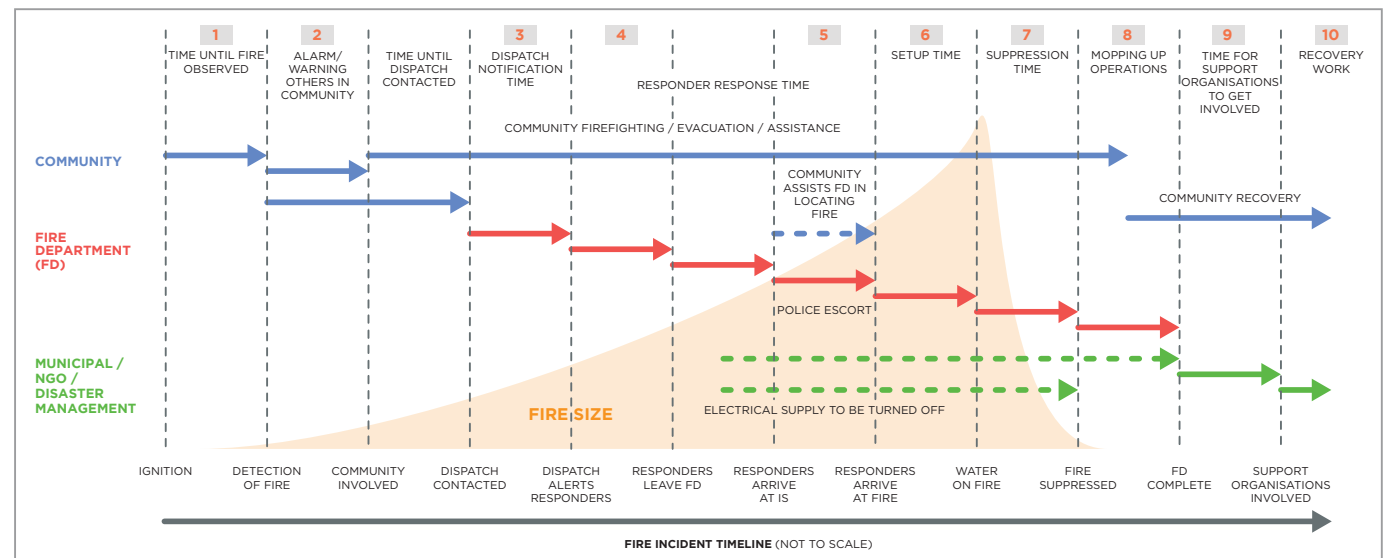
Reducing the amount of available fuel before, or during, a fire incident will help slow fire spread.

A FIRE INCIDENT TIMELINE

(see timeline below)

Time is of the essence in any fire. Delays in response efforts may result in many more homes being burnt down.

- 1 There is a period of time before the first person notices a fire (made worse by drugs or alcohol). Smoke or fire alarms help provide early warning.
- 2 Community members warn each other and must phone the CORRECT fire department number. Community firefighting starts.
- 3 Dispatch at the fire department receives the call and informs the firefighters.
- 4 Firefighters may struggle to locate the fire due to narrow roads, overhanging cables, no street markings or poor directions. Community members can guide fire trucks.
- 5 The fire department may need a police escort or for the municipality to turn off the electrical supply.
- 6 Firefighters will setup their hoses and use water from their truck, hydrants and tankers.
- 7 Firefighters will put the fire out. Residents sometimes cut fire hoses during operations (to aim the water at their own home), which delays efforts significantly. Helpful residents make a big difference.
- 8 The Fire & Rescue Service Incident Report (FRSIR) is completed to allow the event to be documented.
- 9 Disaster Risk Management, Informal Settlement Management, NGOs and other community-based organisations take charge of post-fire recovery.
- 10 Recovery efforts can be quick for small fires. For big fires it can take months or years.

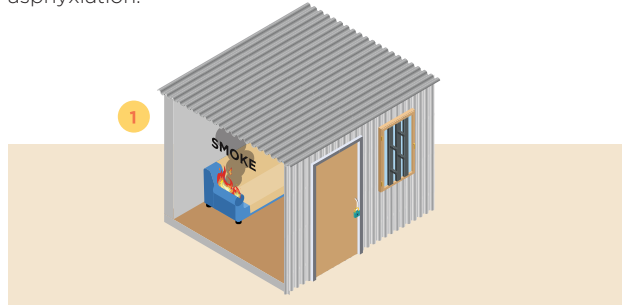


FROM SPARK TO INFERNO

Different interventions will work at different stages of a fire. The most important stages are:

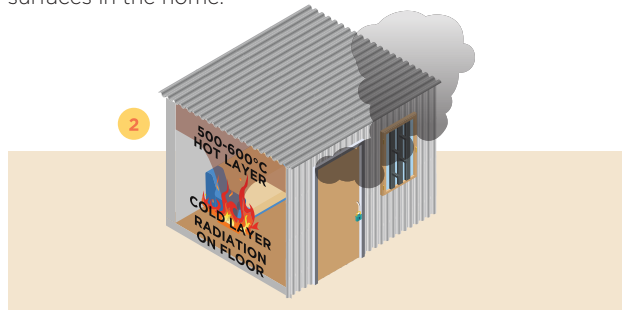
1. IGNITION / INCIPIENT STAGE

Once a fire has started it spreads to other items (fuel) as it grows. Smoke and hot gases rise to the ceiling (the hot layer) while people may still be able to survive in the lower, cold layer. Once smoke fills the room, people will die of asphyxiation.



2. PRE-FLASHOVER / GROWTH

The fire grows and hot gases rise to the roof. When the hot layer reaches around 500-600°C "flashover" occurs when suddenly the fire spreads to all exposed combustible surfaces in the home.



3. POST-FLASHOVER / FULLY-DEVELOPED

Temperatures reach 800-1200°C and nobody will survive. Flames will come out of any openings. Fire spread to nearby dwellings will occur.

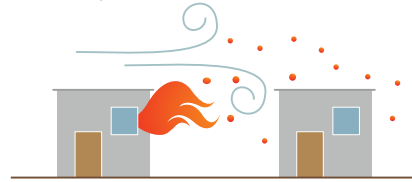


WHAT MAKES FIRES SPREAD FASTER?

There are many factors that influence how fast fires will spread through an informal settlement or suburb. By understanding these you can identify higher risk areas.

WIND

Strong winds will make fires move much quicker. Small burning embers are blown over obstacles (e.g. walls, rivers, roads) and cause spot fires.



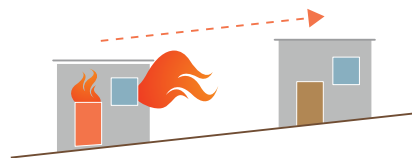
DENSITY AND SPACING OF HOMES

Fires move very quickly through areas where homes are close together. People cannot escape easily from dense settlements.



SLOPE

Fires spread much faster uphill than down.



MATERIALS

Thin items ignite quickly. Plastic sheets on roofs, curtains, rubbish bags outside, cardboard linings and newspaper pushed into holes provide a route for fires into homes.



MOISTURE

During dry seasons and droughts fires spread faster. However, many smaller fires occur in wet weather from indoor cooking and heating.

FIRE SPREAD BETWEEN HOMES

There are many ways that fire can spread from one home to another, and our interventions should try prevent this from happening.



FIRE SPREAD

- 1 Flame impingement:** Flames can cross distances of 2-3m, or further in wind.
- 2 Radiation:** Radiation can cause items 2-5m away, and further, to ignite.
- 3 Branding/spotting:** Flaming brands can be carried long distances and start new fires.

FACTORS INFLUENCING SPREAD

- 4** Small holes in walls/roofs can easily allow flames to ignite homes.
- 5** Bigger openings (e.g. door) = bigger flames coming out.
- 6** Doors (if left open) and windows (glass falls out) will always be weak points.
- 7** Plastics (for waterproofing), cardboard, curtains etc. are easily ignited.
- 8** Wood, plants and rubbish act as fire bridges.