SIMULATION #1

9 July 2026

Public Reaction to a Prolonged UK Heat Wave: Simulation Findings and Communications Strategy

Executive Summary

The verdict: a fully-funded, comprehensive emergency response turned a frightened, frustrated public into a relieved and supportive one — but only because the package was concrete, universal, and visibly fair. When the simulation began with a four-week heat wave and no government plan, public sentiment was deeply negative (net sentiment **-1.00** at Wave 1) and the most vulnerable groups were panicking. The single biggest turning point came at Wave 5, when the government launched its National Heat Emergency Response. Sentiment swung from **-0.63** at Wave 4 to **+0.50** at Wave 5, and climbed steadily to **+0.91** by Wave 8. The lesson is unambiguous: the public will reward fast, funded, fairly-distributed action — and punish silence.

The single biggest risk is the gap between announcement and delivery. Even as sentiment recovered, the most exposed groups — lone parents in unaffordable flats, social renters, and older people with health conditions — kept asking whether the promised help would actually reach them. Working-Age Social Renters put it plainly at Wave 7: *"that's the test now — follow-through."* If welfare checks, cooling centres, or bill credits fail to materialise on the ground, the recovered goodwill could collapse just as fast as it built.

The single most important recommendation is to treat delivery and visible proof of delivery as the centrepiece of the entire response — not the announcement itself. The simulation shows the public moved on the *promise*; sustaining their trust over four weeks depends entirely on proving the promise is being kept, especially in communities like Sparkhill that expect to be "an afterthought."

How the simulation unfolded: The early waves (1–4) were dominated by fear, anger at institutional silence, and a powerful sense of unfairness — renters felt abandoned, the elderly felt frightened, and almost everyone felt the government was missing in action. A rain forecast at Wave 4 provided no real comfort. The Wave 5 emergency package resolved the three core anxieties — cost, safety, and competence — simultaneously, and across almost every segment. Sentiment, disengagement, and convergence all improved sharply. By the final waves the public had largely consolidated around cautious gratitude, tempered by realism about structural housing problems the package did not fix.

Simulation Overview

The policy question was: **how would the public react if there was a prolonged heat wave, over four weeks long, in the UK starting tomorrow?** We modelled fifteen population segments spanning the full range of housing tenures, ages, incomes, and vulnerabilities. Their starting stances were mixed: several were **opposed** to any framing that minimised the crisis because they bore its worst material costs — Lone Parents in Social Housing, Working-Age Social Renters Without Children, Private Renters in Middle Age, and Older Adults with Long-Term Health Conditions. Several were **conditional**, willing to support action only if it was fair and effective — Young Urban Renters, Higher-Educated Urban Professionals, Older Working Adults Approaching Retirement, and Ethnic Minority Communities in Urban Areas. The rest were **ambivalent** — Established Homeowners, Retired Outright Homeowners, Married Couples with Dependent Children, Full-Time Students, Older Widowed or Single Persons Living Alone, Cohabiting Couples Without Children, and Rural and Semi-Rural Low-Income Households.

The simulation ran across **eight waves**. Two stimuli were injected:

- **A rain forecast** (high strength, sustained) — introduced at Wave 4 and persisting as a background condition through Wave 5. This was modest weather news suggesting scattered showers, not relief.

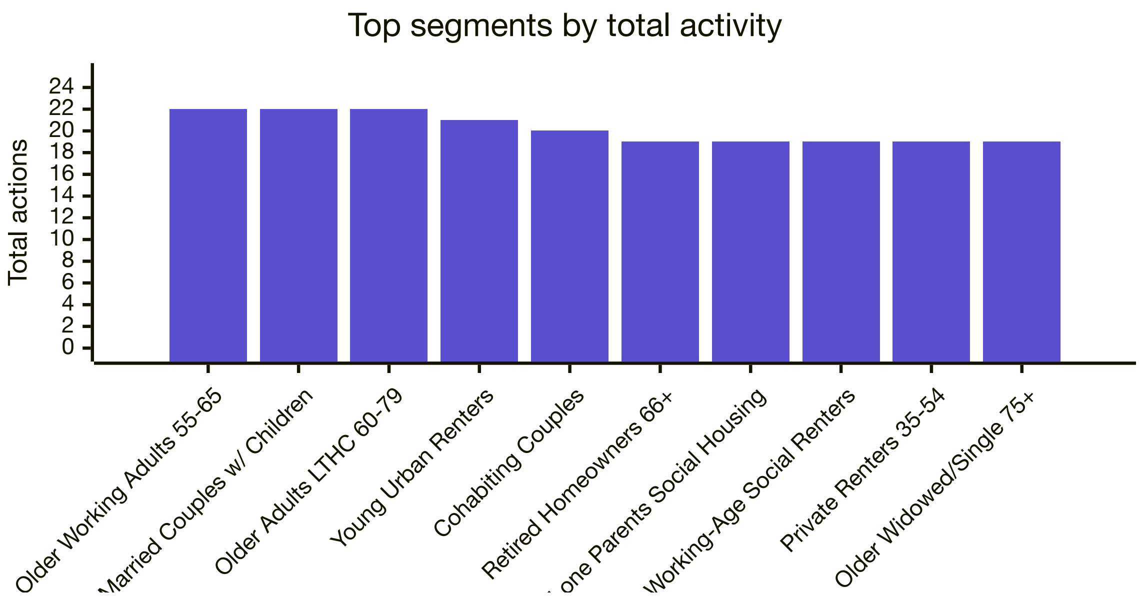
- **The Government's fully-funded National Heat Emergency Response** (high strength, permanent) — introduced at Wave 5 and remaining in place as the established condition through Wave 8. This package opened free air-conditioned cooling centres with transport, guaranteed no household would pay more to stay cool, delivered free home cooling units and daily welfare checks to everyone over 70 and those with long-term health conditions, gave outdoor and frontline workers paid heat-leave, and surged emergency funding into the NHS. All main parties backed it and pledged it would last until the heat wave ended.

Headline Outcomes

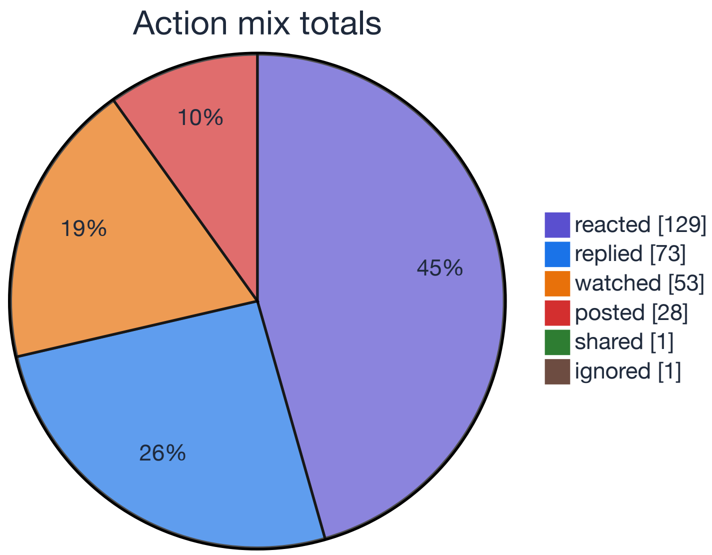
The simulation ended in a strongly positive place after starting at rock bottom.

Measure	Value
Final net sentiment	**+0.91**
Starting net sentiment (Wave 1)	**-1.00**
Peak polarisation	**0.18** (Wave 2)
Total disengaged at end	**12%**
Peak disengagement	**92%** (Wave 4)
Total posts	**28**
Peak cascade rate	**0.86** (Wave 7)
Final convergence	**0.72**

Activity was spread remarkably evenly across segments, reflecting that a heat wave touches everyone. The most active segments were Older Working Adults Approaching Retirement, Married Couples with Dependent Children, and Older Adults with Long-Term Health Conditions — all tied at the top.

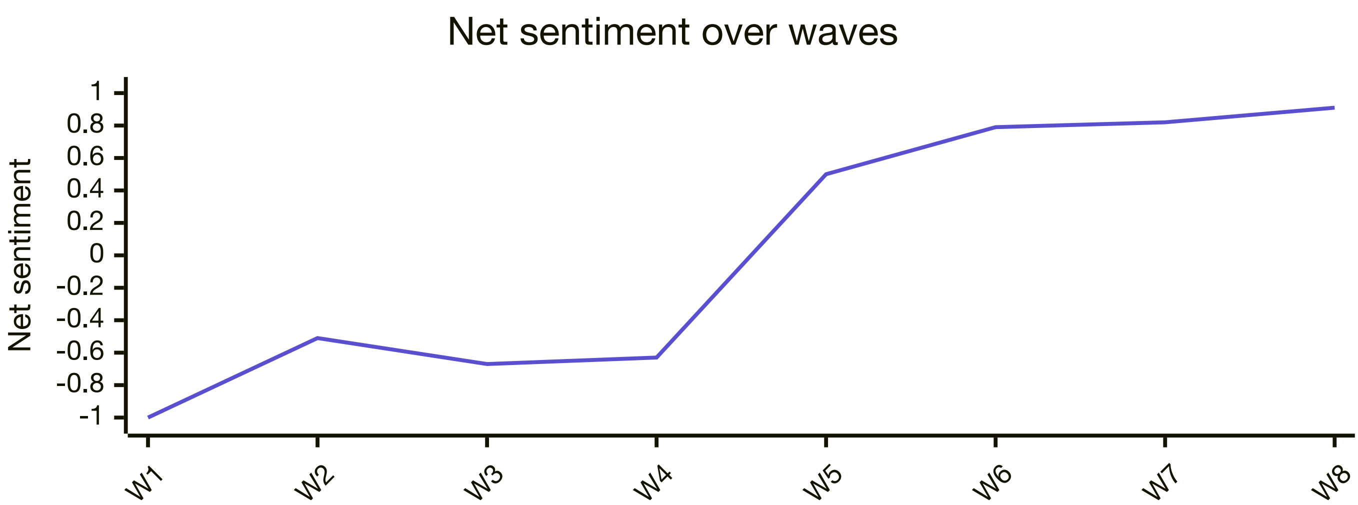


The action mix was dominated by reactions and replies — this was a highly conversational, mutually-supportive population rather than a broadcasting one. People talked *to* each other far more than they talked *at* the world.

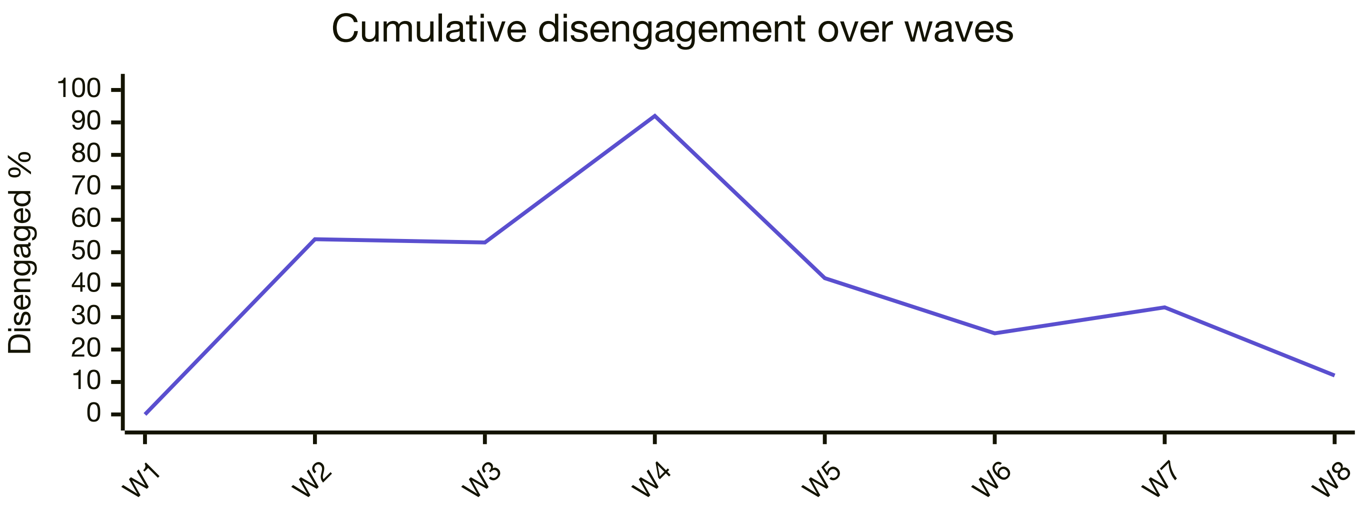


Wave-by-Wave Narrative

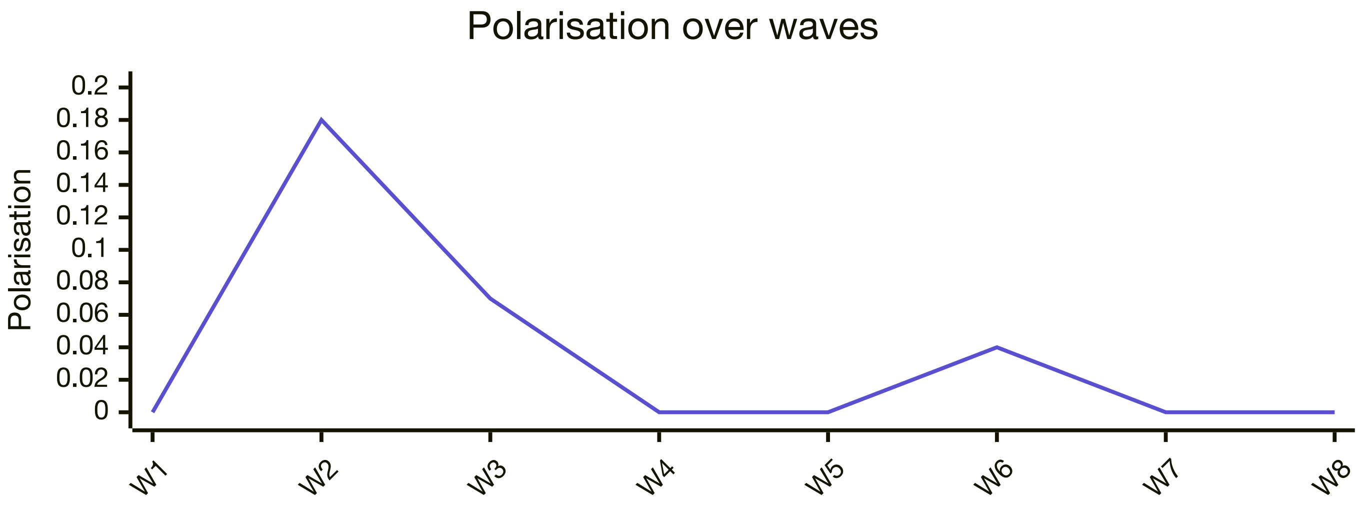
Waves 1–2: Fear and anger at silence. The simulation opened at the lowest possible sentiment (**-1.00**) as every segment processed the four-week forecast through its own vulnerability. Renters feared unaffordable, uncoolable flats; the elderly feared the nights; parents feared for their children. Young Urban Renters posted: *"four WEEKS?? ngl i'm genuinely panicking rn. my flat is already a oven in normal summer and my landlord takes two weeks to reply to emails."* By Wave 2, sentiment recovered somewhat to **-0.51** as people found each other and offered mutual support, but polarisation peaked here at **0.18** — the highest of the simulation — as a clear fault line opened between those with adaptive options (homeowners) and those without (renters and the vulnerable). Cascade rate jumped to **0.81**, showing reactions spreading rapidly through the network. Crucially, disengagement also spiked to **54%** as some segments retreated into watching rather than acting.



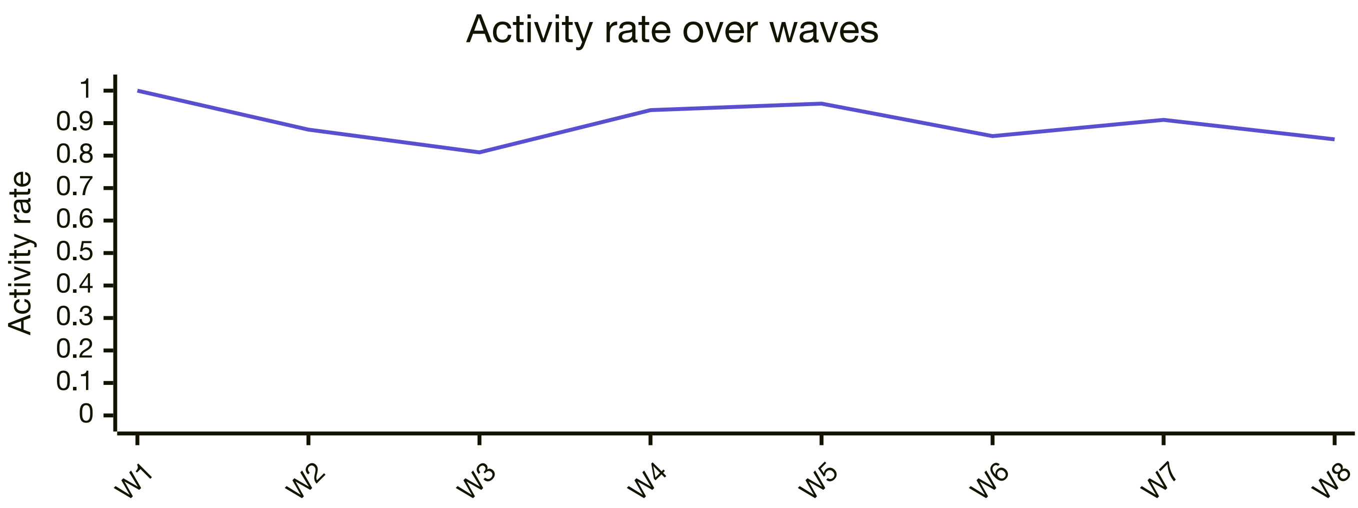
Waves 3–4: Grievance crystallises, then a false dawn. At Wave 3 sentiment dipped again to **-0.67** as the renter-specific grievance hardened. The conversation shifted from fear to accountability — landlords who ignore emails, councils who go silent, a government "nowhere." Cohabiting Couples escalated: *"that's not negligence, that's deliberate. we need emergency tenant rights NOW, not guidance on how to hydrate."* The rain forecast arrived at Wave 4 but provided no genuine comfort — Young Urban Renters noted *"the rain forecast is literally just showers... so like we're still looking at hot spells in between?"* Sentiment barely moved (**-0.63**), but disengagement surged to its peak of **92%** — a striking sign that without real action, large parts of the population were emotionally checking out, exhausted and resigned.

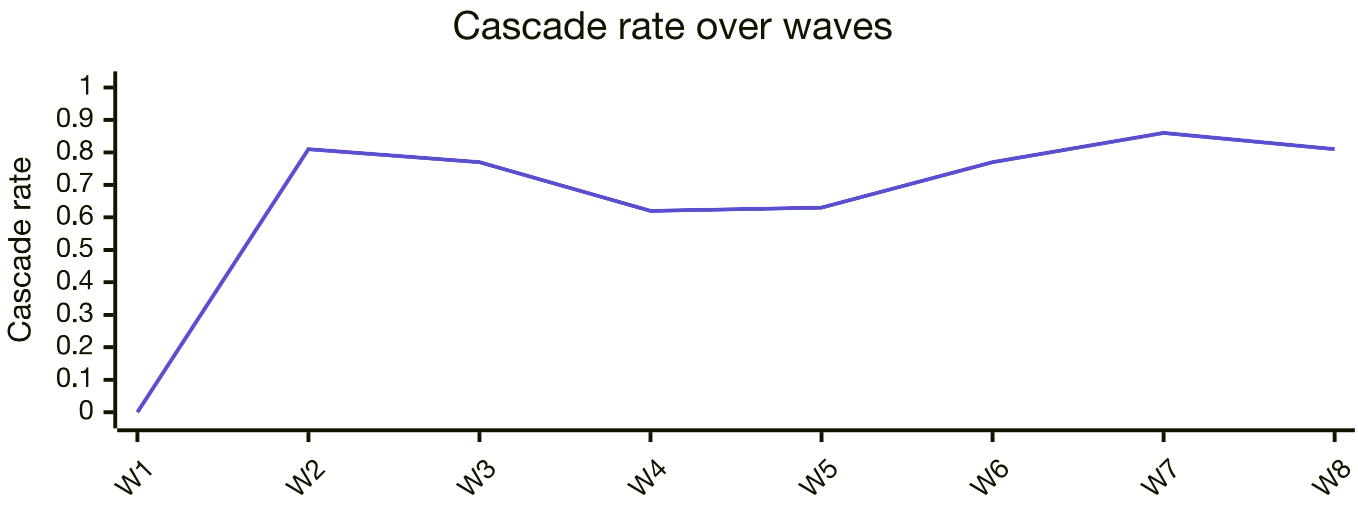


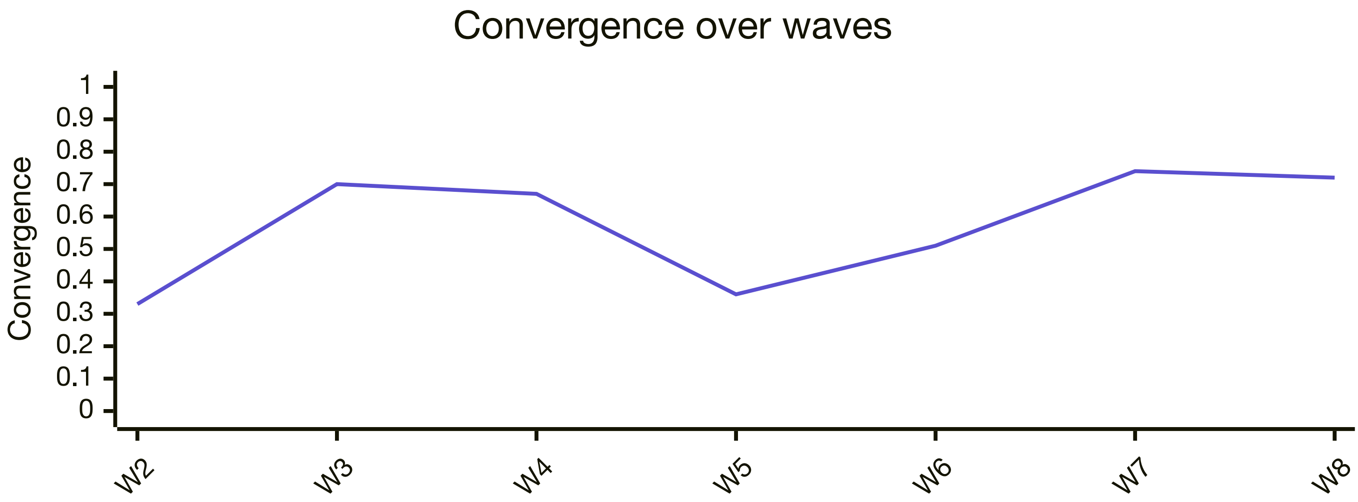
Wave 5: The turning point. The National Heat Emergency Response landed and transformed the picture. Net sentiment leapt from **-0.63** to **+0.50** in a single wave, and disengagement collapsed from **92%** to **42%** as people re-engaged with genuine relief. The package worked because it resolved every major anxiety at once — cost, safety, and competence. Established Homeowners captured the shift: *"genuinely relieved. Free cooling centres, no emergency bills, emergency A&E support, and rain incoming. This is what proper crisis management looks like."* Even the most sceptical Young Urban Renters conceded: *"the emergency response package is actually... good?... this is what i mean[t]."* Polarisation fell to zero — the divide between haves and have-nots dissolved because the package covered everyone.



Waves 6–8: Consolidation around cautious gratitude. Sentiment kept climbing — **+0.79** at Wave 6, **+0.82** at Wave 7, **+0.91** at Wave 8 — as living under the response confirmed it was real. Disengagement fell to its lowest of **12%** by the end. The cascade rate hit its peak of **0.86** at Wave 7, showing relief spreading efficiently through trusted relationships. Convergence rose to **0.72**, meaning segments increasingly agreed with one another. But the gratitude was conditional and forward-looking: the conversation moved to *delivery*. Working-Age Social Renters: *"if they actually run the welfare checks properly for a full four weeks it changes the game. that's the test now — follow-through."* Even previously antagonistic Rural households came around: *"the first time I've felt like they remembered we exist out here."*



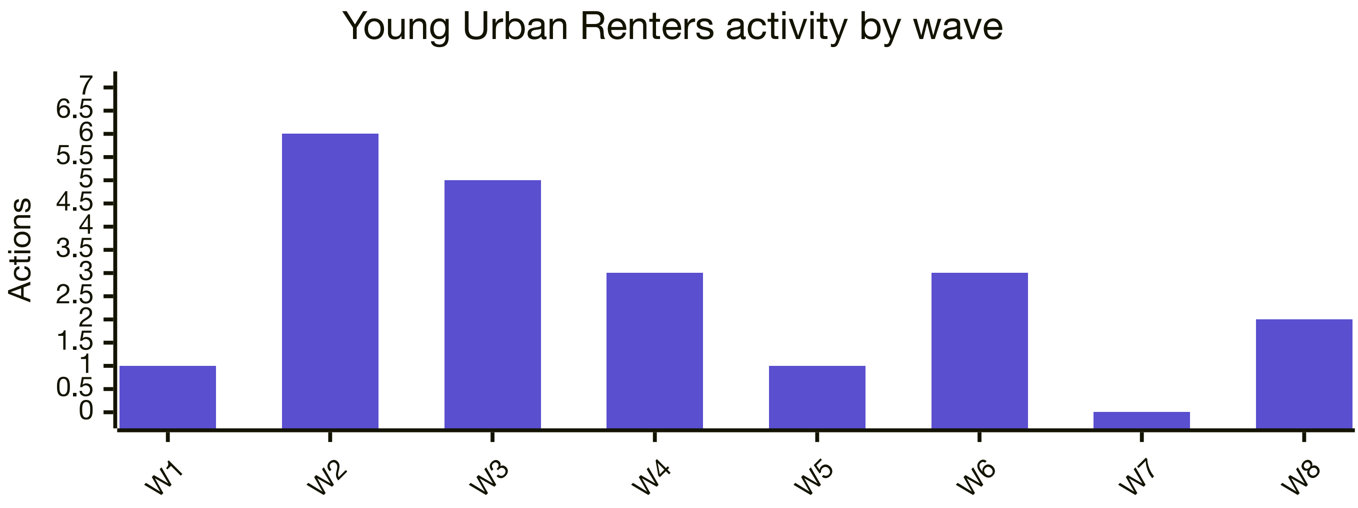




Segment Deep-Dives

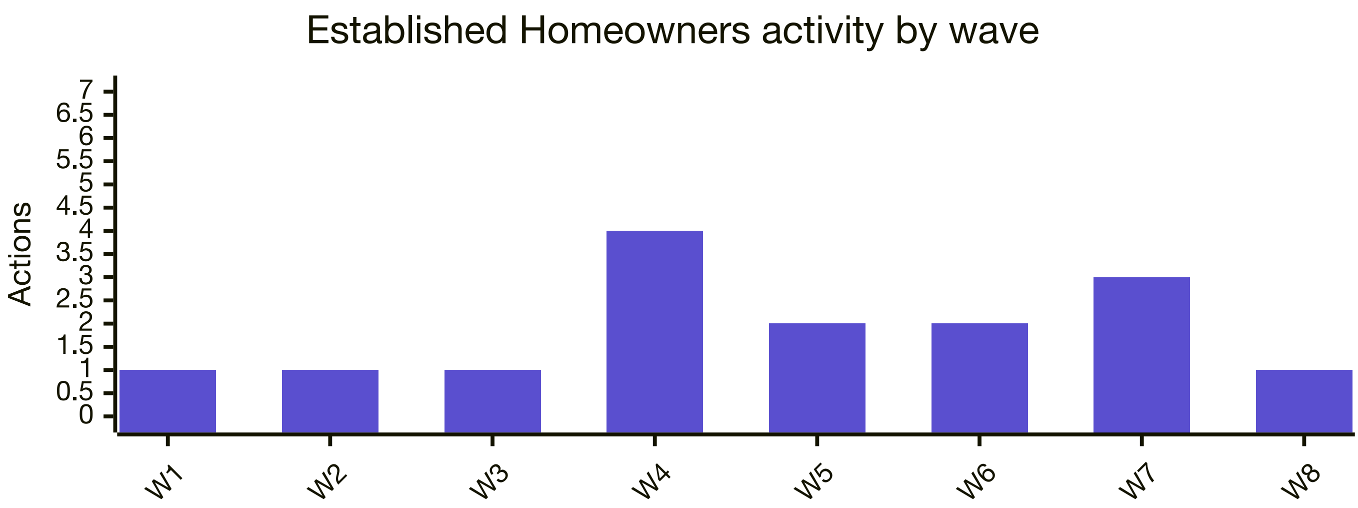
Young Urban Renters (18-34)

Stance: conditional. Aisha's group was among the loudest and angriest early, peaking at 6 actions in Wave 2 as fear curdled into renter-specific grievance. Their shift was driven entirely by perceived fairness: while institutions were silent, they were furious; once the package guaranteed no bill spike and free cooling centres, they flipped to genuine support. Representative quote (Wave 5): *"the emergency response package is actually... good? free cooling centres, no energy bill spike, welfare checks for vulnerable people, paid heat leave for outdoor workers — this is what i mean[t]."* Their lingering caveat remained landlord accountability, which the package did not address.



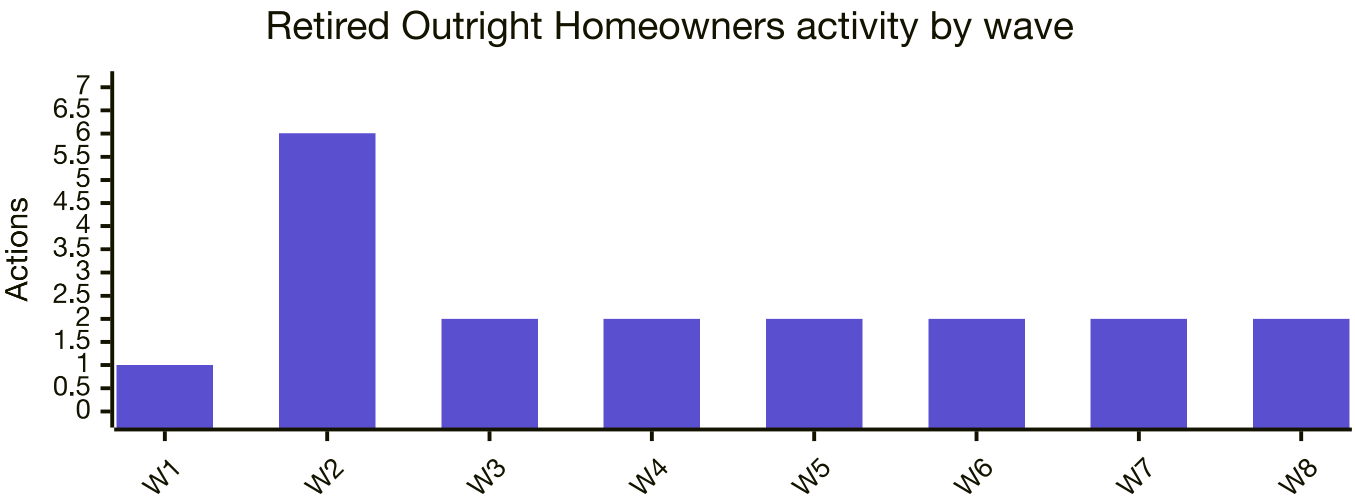
Established Homeowners with Mortgages, Families (35-54)

Stance: ambivalent. David's group started worried about competence and cost, and was relatively quiet until Wave 4 (4 actions), when their anxiety peaked. The package resolved all three of their core concerns — cost, family safety, institutional failure — making them among the most enthusiastic converts. Representative quote (Wave 5): *"genuinely relieved... This is what proper crisis management looks like. Still four weeks ahead but at least we[...]."*



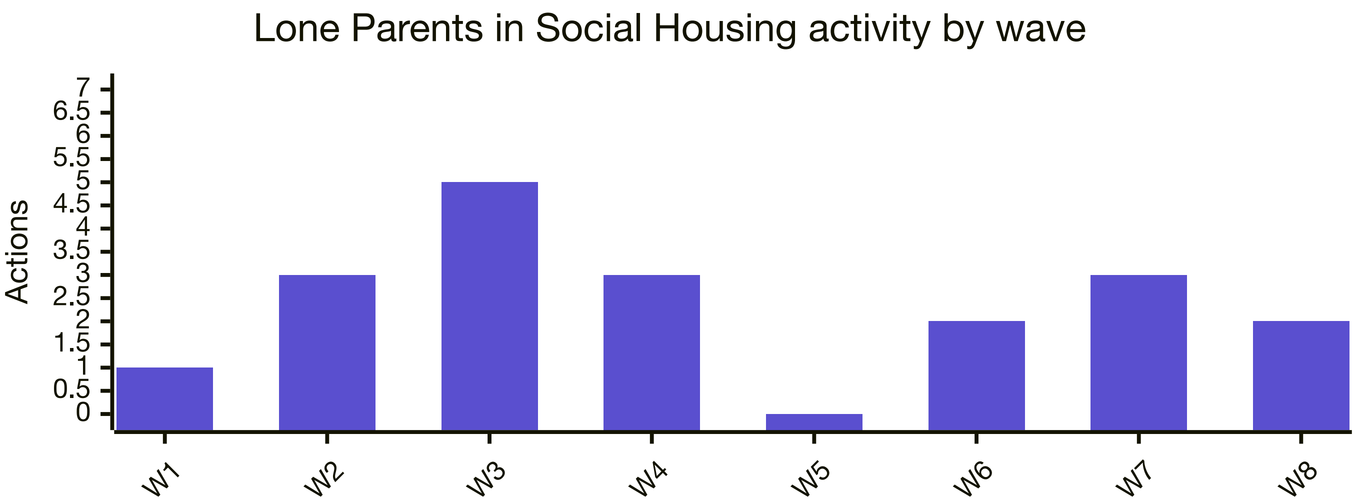
Retired Outright Homeowners (66+)

Stance: ambivalent. Margaret's group was active early (6 actions in Wave 2), driven by a strong caretaking instinct toward more isolated elderly people. They were reassured most by the welfare checks. Representative quote (Wave 8): *"The welfare checks matter most to me — knowing someone will check on Ron next door takes the edge off. Still worried about the full four weeks, but at least I'm not abandoned."*



Lone Parents in Social Housing (25-49)

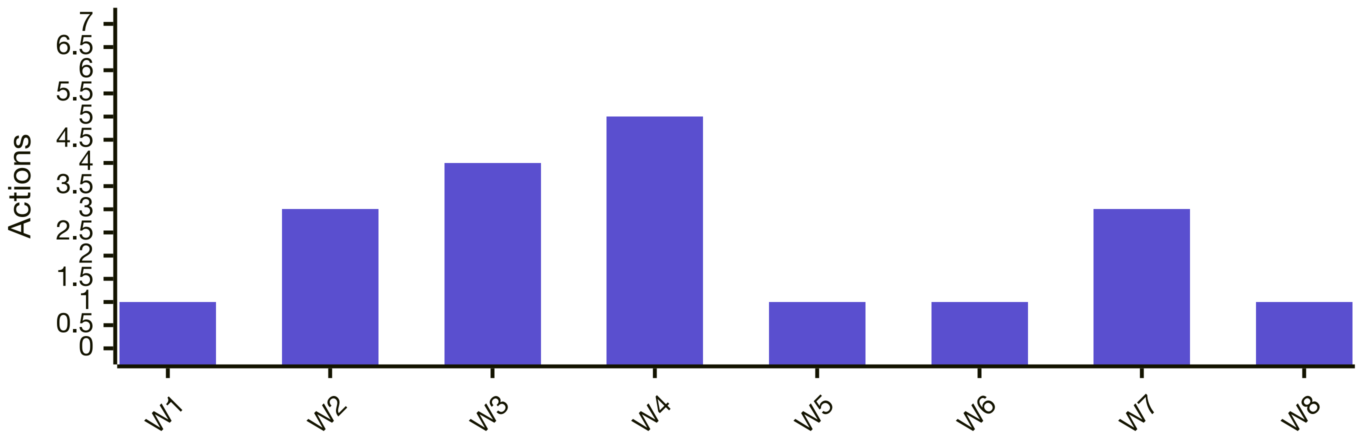
Stance: opposed. Leanne's group bore the worst material costs and stayed opposed longest, focused on the impossible choice between cooling and feeding children. Even after the package they flagged the structural gap (Wave 6): *"cooling centres help but if my flat stays a box i'm still stuck choosing between paying bills and feeding the kids."* By Wave 8 they had cautiously moved: *"free cooling + no bill spike changes everything for us."*



Working-Age Social Renters Without Children (25-54)

Stance: opposed. Jason's group distrusted institutions from the outset and had no adaptive capacity. They were peak-active at Wave 4 (5 actions) in pure frustration. The package moved them, but their support is explicitly conditional on delivery. Representative quote (Wave 7): *"if they actually run the welfare checks properly for a full four weeks it changes the game. that's the test now — follow-through."*

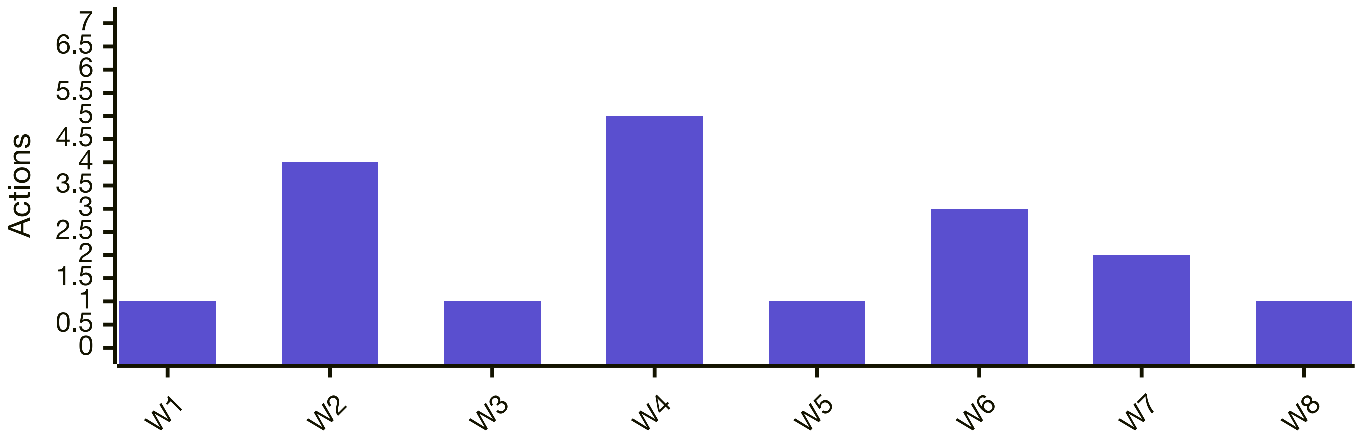
Working-Age Social Renters activity by wave



Higher-Educated Urban Professionals (25-44)

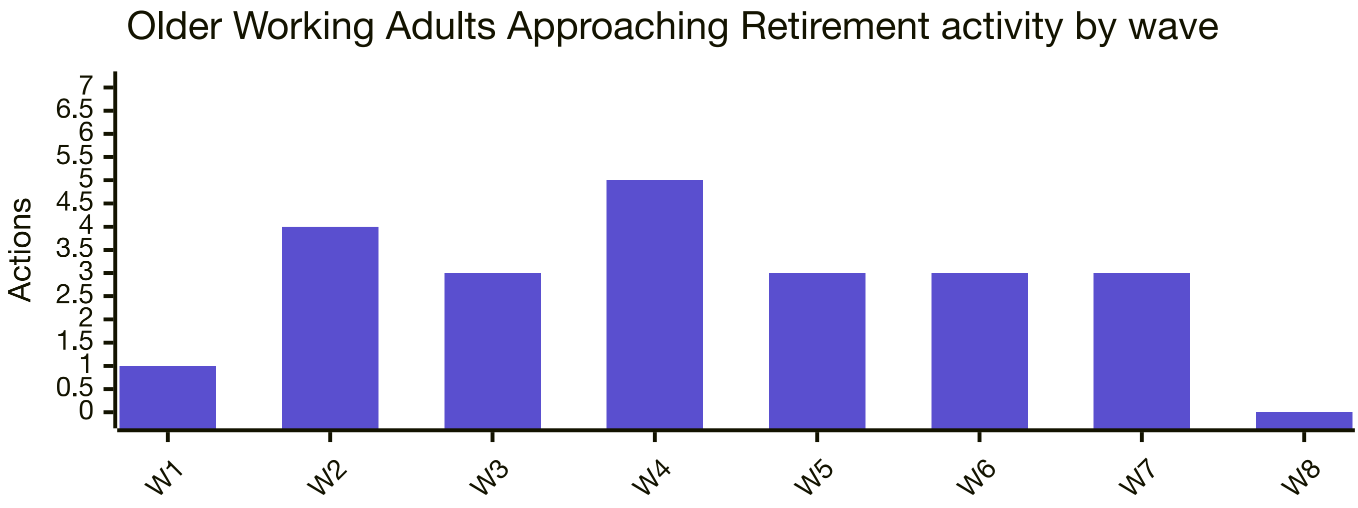
Stance: conditional. Priya's group framed the crisis politically from Wave 1 — as an infrastructure and planning failure, not just weather. They supported the package once it addressed structural burden-sharing, but kept the focus on whether it reached everyone. Representative quote (Wave 6): *"The no energy bill spike part is huge for renters. Still doesn't fix the flat itself but at least the system isn't punishing us for existing in a heatwave."*

Higher-Educated Urban Professionals activity by wave



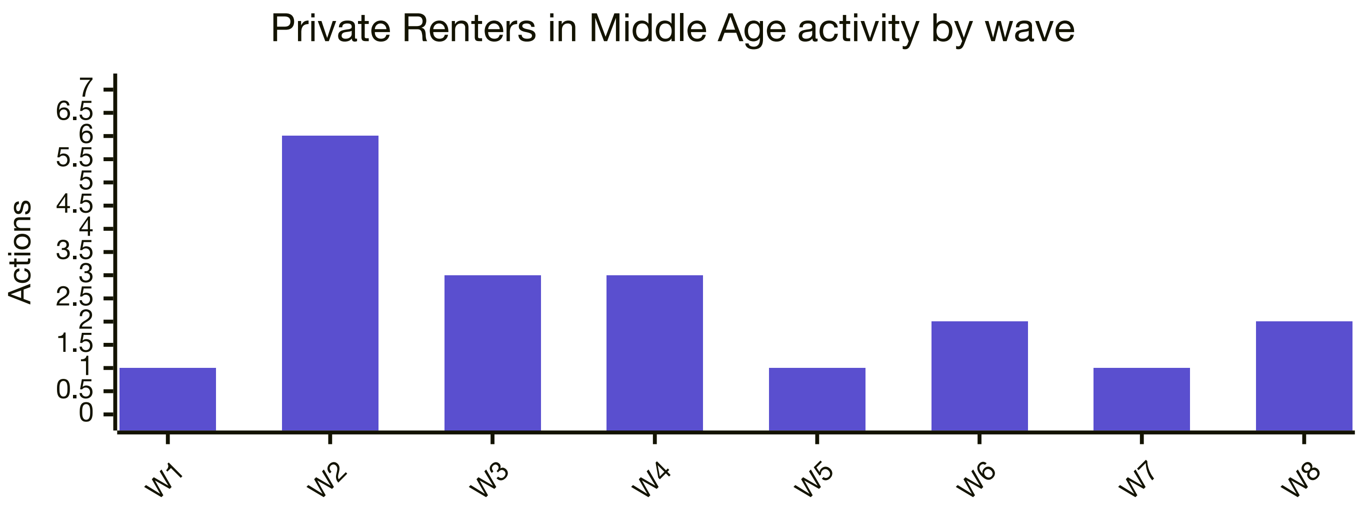
Older Working Adults Approaching Retirement (55-65)

Stance: conditional. Robert's group was the most active overall (22 actions), driven by worry for ageing relatives and a demand for practical, non-bureaucratic action. They consistently played a bridging role, urging others toward concrete steps. Representative quote (Wave 7): *"If the welfare checks actually reach older people in Sparkhill and the centres stay open all four weeks, it shows this wasn't just political theatre."*



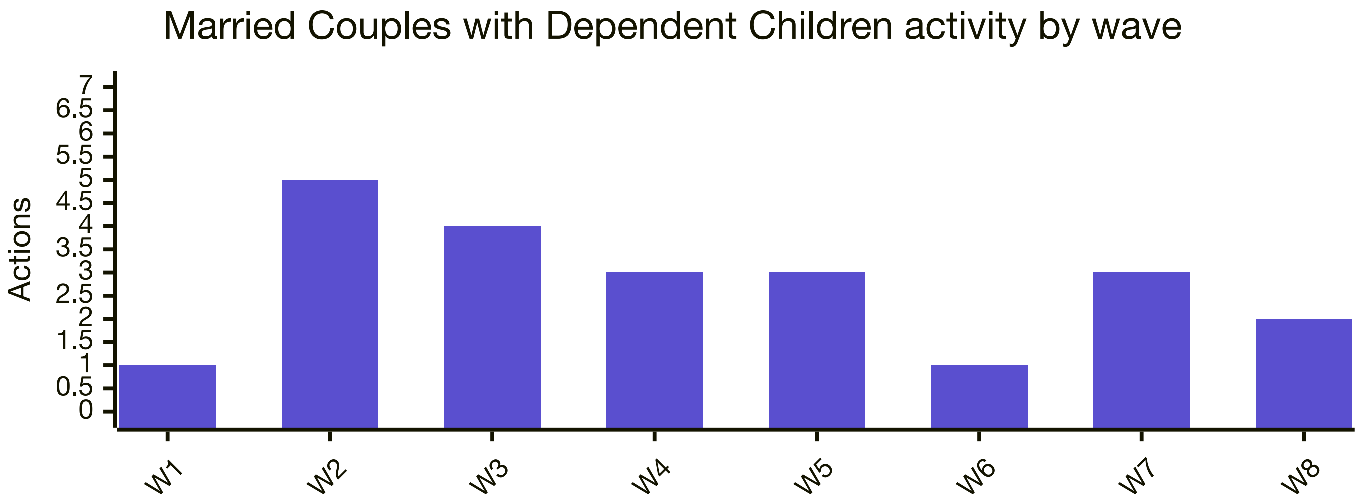
Private Renters in Middle Age Without Children (35-54)

Stance: opposed. Claire's group had zero adaptive capacity within their tenancy and were among the most materially trapped. They were peak-active at Wave 2 (6 actions). The package removed the "impossible choice" but left the structural problem standing. Representative quote (Wave 6): *"I'm cautiously less furious. The cooling centres and energy bill protection actually mean I don't have to choose between sleeping or going broke."*



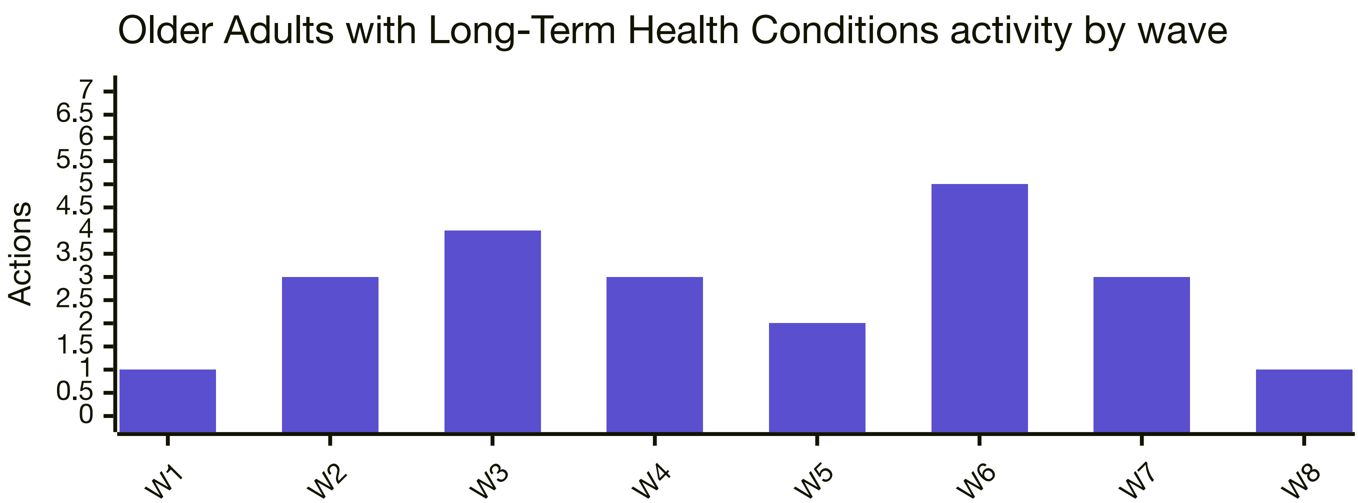
Married Couples with Dependent Children, Homeowners (30-50)

Stance: ambivalent. Tom's group judged everything by whether it tangibly helped their kids and home. They showed empathy for renters' plight throughout and welcomed the package on practical grounds. Representative quote (Wave 7): *"The welfare checks for older people are spot on — my mum's been on my mind all week. Glad someone's actually thinking it through properly."*



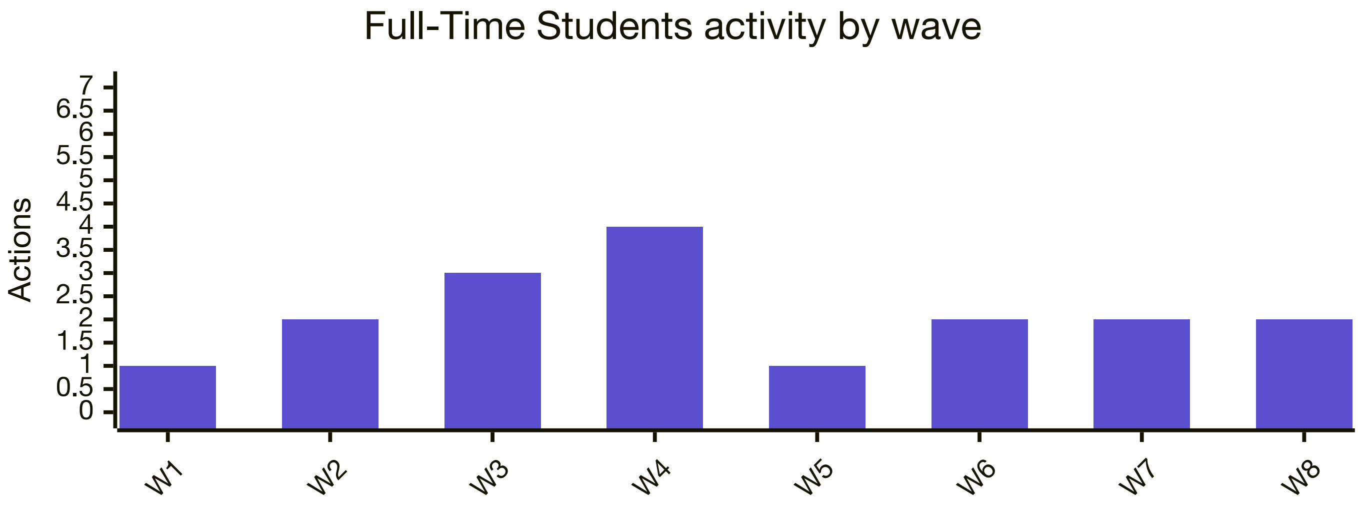
Older Adults with Long-Term Health Conditions (60-79)

Stance: opposed. Barbara's group faced genuine risk of hospitalisation and was acutely focused on real support over leaflets. They were highly active throughout (22 actions), peaking at Wave 6 (5 actions). They were directly targeted by the package's home cooling units and welfare checks. Representative quote (Wave 2): *"We need real support, not just leaflets. My worry is the same — house doesn't cool, and the NHS is already stretched."*



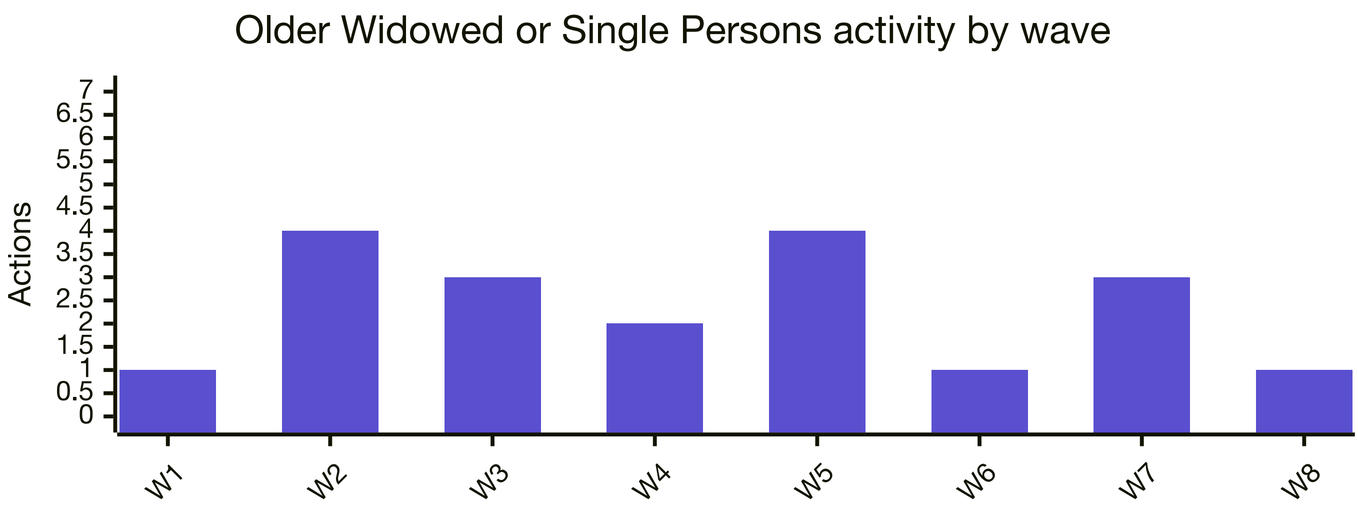
Full-Time Students in Higher Education (18-24)

Stance: ambivalent. Callum's group felt the heat intensely and personally — through revision and unbearable rooms — but had no fixed policy view. They moved toward support and were notably pleased to be explicitly named. Representative quote (Wave 8): *"free cooling centres + no bill panic + they're talking about students??? that's... lowkey different. still 4 weeks but at least someone's taking it seriously."*



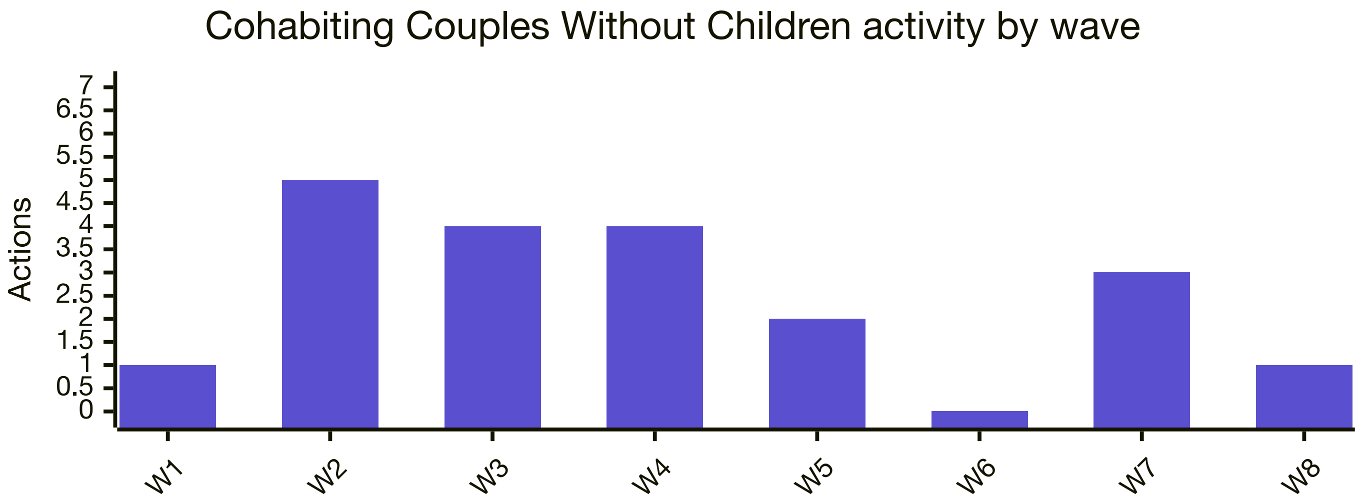
Older Widowed or Single Persons Living Alone (75+)

Stance: ambivalent. Dorothy's group experienced the heat as a frightening physical threat and depended emotionally on whether care visibly reached them. The welfare checks were precisely what they needed. Representative quote (Wave 5): *"I feel rather relieved this morning. The announcement of the cooling centres and the welfare checks — it is reassuring to know someone is taking this seriously."*



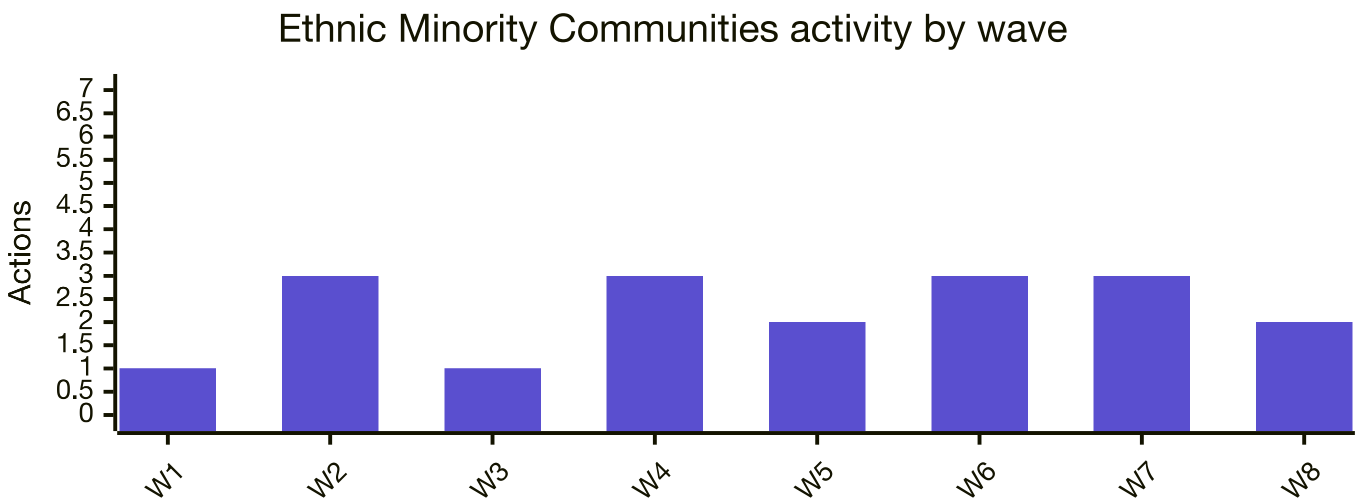
Cohabiting Couples Without Children (25-44)

Stance: ambivalent. Sophie's group framed the heat wave as an infrastructure crisis and channelled climate concern through housing frustration. They had the means to cope but were genuinely angry at unpreparedness. The funded response shifted them to "conditional-hopeful." Representative quote (Wave 5): *"the government actually stepping up with funded cooling centres and emergency support is... not what i expected."*



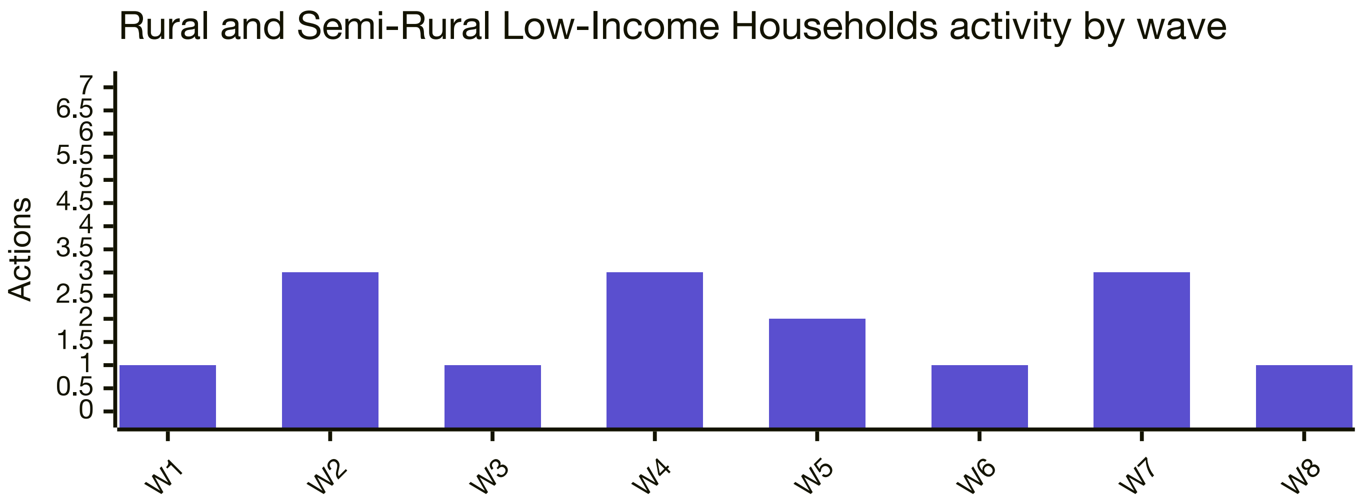
Ethnic Minority Communities in Urban Areas (All Ages)

Stance: conditional. Mohammed's group faced compounded exposure — overcrowded housing, vulnerable elders, physical jobs — and their support hinged on equitable, culturally-aware delivery. They actively mobilised their community (the mosque calling the council) and watched implementation closely. Representative quote (Wave 6): *"if they actually deliver on the welfare checks and cooling centres in Sparkhill — properly reaching our elders, not just the usual gaps — this changes everything. mum's breathing easier."*



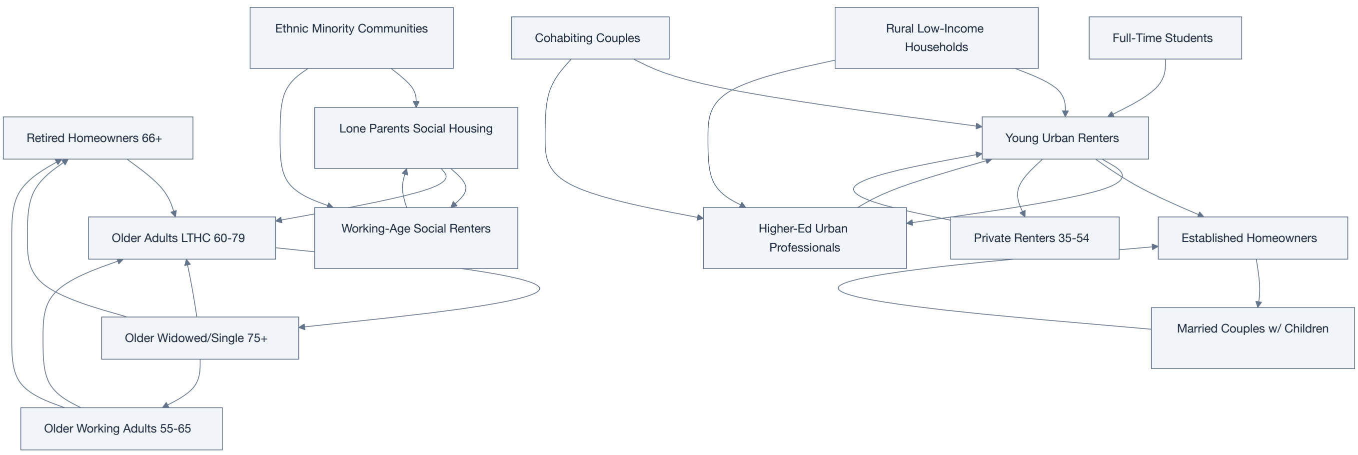
Rural and Semi-Rural Low-Income Households (All Working Ages)

Stance: ambivalent. Karen's group felt forgotten and fatalistic, experiencing the heat as grinding practical hardship rather than a political event. They were the most surprised converts, moved by feeling finally seen. Representative quote (Wave 7): *"I was proper cynical about this too, but the heating allowance and the welfare checks actually help. Not perfect but it's the first time I've felt like they remembered we exist out here."*



Relationship Dynamics

The network was tightly clustered around three communities of mutual support: an **older/vulnerable cluster** (Retired Homeowners, Older Adults with Health Conditions, Older Widowed Persons, Older Working Adults), a **renter/social-housing cluster** (Young Urban Renters, Private Renters, Lone Parents, Social Renters, Students, Cohabiting Couples), and an **homeowner-family cluster** (Established Homeowners, Married Couples). These clusters carried influence efficiently — the peak cascade rate of **0.86** at Wave 7 shows relief flowing rapidly through these trusted ties.



Two dynamics matter most. First, the **early polarisation at Wave 2** ran along the one antagonistic axis in the network — Young Urban Renters versus Established Homeowners (economic), echoed by Rural households' antagonism toward urban professionals. The package neutralised this divide by covering everyone, collapsing polarisation to zero. Second, the **welfare-check message cascaded powerfully through the older cluster**: Retired Homeowners, Older Working Adults, and Married Couples all amplified relief about checks on vulnerable elders, with the dependency ties (Older Widowed → Older Working Adults; Lone Parents → Older Adults) ensuring the reassurance reached the most isolated. The renter cluster cascaded the "no bill spike" relief among themselves while keeping a shared, unresolved grievance about landlords.

Risk Assessment

Segment	Level	Description
Lone Parents in Social Housing (25-49)	High	Bears the worst material costs; children's health at stake and no financial buffer. Moved cautiously but flagged that cooling centres do not fix the "box" flat — support is fragile and delivery-dependent.
Older Adults with Long-Term Health Conditions (60-79)	High	Genuine risk of hospitalisation or worse. Directly reliant on home cooling units and daily welfare checks actually arriving; any delivery failure is a life-safety and trust catastrophe.
Older Widowed or Single Persons Living Alone (75+)	High	Frightened, isolated, emotionally volatile, dependent on care being *visibly* delivered. Reassured by welfare checks but will spiral if checks are missed.
Working-Age Social Renters Without Children (25-54)	High	Distrusts institutions, no adaptive capacity. Explicitly conditional on four-week follow-through; primed to feel "on our own again" if delivery slips.
Ethnic Minority Communities in Urban Areas (All Ages)	High	Compounded exposure and a baseline expectation of being an "afterthought." Support hinges on equitable, culturally-aware delivery reaching areas like Sparkhill, not "the usual contacts."
Private Renters in Middle Age Without Children (35-54)	Medium	No remedy within their tenancy. Relief is real but partial — the sauna flat remains. Grievance could re-harden if heat persists without structural help.
Young Urban Renters (18-34)	Medium	Conditional support secured, but residual anger at landlords unaddressed. Could swing back to protest if costs reappear or fairness is perceived to slip.
Rural and Semi-Rural Low-Income Households (All Working Ages)	Medium	Fatalistic and easily forgotten; won over by feeling "seen." That goodwill is shallow and will reverse if rural delivery proves weaker than urban.
Full-Time Students in Higher Education (18-24)	Medium	Vocal and pleased to be named, but un-anchored. Sustained heat through exams could renew grievance if institutions stay silent.
Higher-Educated Urban Professionals (25-44)	Medium	Supportive but watching for structural follow-through; vocal critics if delivery is uneven across communities.
Established Homeowners with Mortgages, Families (35-54)	Low	Core anxieties (cost, safety, competence) resolved; among the most satisfied.

Segment	Level	Description
Retired Outright Homeowners (66+)	Low	Reassured by welfare checks; broadly supportive and acting as a calming influence.
Married Couples with Dependent Children, Homeowners (30-50)	Low	Practical concerns met; supportive on tangible grounds.
Older Working Adults Approaching Retirement (55-65)	Low	Satisfied that action was decisive and practical; a stabilising, bridging voice.
Cohabiting Couples Without Children (25-44)	Low	Have means to cope; moved to hopeful by the funded response.

Recommendations

1. **Because the entire sentiment recovery from Wave 5 onward rested on the *promise* of delivery — with every high-risk segment explicitly conditioning support on follow-through (Working-Age Social Renters at Wave 7: "that's the test now — follow-through") → make visible, verifiable delivery the centrepiece of the response.** Publish daily proof: numbers of welfare checks completed, cooling centres open, cooling units delivered. Treat any missed welfare check as a critical incident.

2. **Because disengagement peaked at 92% at Wave 4 during the silent, action-free period → never allow an information vacuum.** The public emotionally checked out when institutions went quiet. Communicate early and continuously, even before the full plan is ready, to hold engagement.

3. **Because polarisation peaked at 0.18 at Wave 2 along the renter-versus-homeowner fairness divide, and collapsed to zero only once the package visibly covered everyone → keep universality front and centre in all messaging.** The "no household pays more, everyone over 70 covered" framing was what dissolved the divide. Any perceived carve-out or postcode lottery will re-open it.

4. **Because Ethnic Minority Communities and Rural households repeatedly raised fears of being "the usual gaps" and "forgotten out here" (Wave 6 and Wave 7) → audit and publicly report delivery in under-served and hard-to-reach areas specifically.** Equity of delivery, not just existence of the scheme, drives their trust.

Per-segment engagement guidance

- **Lone Parents in Social Housing:** Lead with the child-centred and cost-relief angle — "your kids can get to a cool space and you won't pay more." Acknowledge openly that the flat itself is still hot; do not oversell.
- **Older Adults with Long-Term Health Conditions:** Be concrete and clinical — confirm exactly when their home cooling unit and welfare check will arrive, and reassure that NHS/111 capacity is funded. Avoid abstraction; they want "real support, not just leaflets."
- **Older Widowed or Single Persons Living Alone:** Emphasise the human reassurance of welfare checks — "someone official will knock on your door." Warm, calm, repeated contact; never miss a scheduled check.
- **Working-Age Social Renters:** Demonstrate follow-through, not promises. Show the scheme holding up "for the full four weeks." This sceptical group responds to proof, not announcements.
- **Ethnic Minority Communities:** Work through trusted community institutions (mosques, community groups already mobilising), show culturally-aware delivery reaching their elders directly, and report on coverage in specific neighbourhoods like Sparkhill.
- **Private Renters & Young Urban Renters:** Stress the bill-protection and cooling-centre access that removes the impossible choice. Acknowledge the unresolved landlord problem honestly — they respect candour over spin.
- **Rural and Semi-Rural Low-Income Households:** Use "we haven't forgotten you out here" framing and show specific rural provision. Their goodwill is real but shallow — protect it with visible rural delivery.
- **Full-Time Students & Higher-Educated Professionals:** Name them explicitly (students valued this) and address structural fairness — they want to know the system "isn't punishing us for existing in a heatwave."

Indicators to monitor

1. **Re-emergence of the fairness/renter grievance** — watch for renewed "renters are being left to suffer" framing, which preceded the Wave 2–3 polarisation. Its return signals the universality message is breaking down.

2. **Disengagement spikes** — a sudden drop in public engagement (as at Wave 4) is an early warning that people sense inaction or feel abandoned, even if sentiment hasn't yet turned.

3. **"Follow-through" and "did they actually deliver" language** — the high-risk segments are watching delivery, not announcements. A rise in scepticism about whether welfare checks and cooling centres are real on the ground is the leading indicator of a trust collapse.

Glossary

Term	Definition
Wave	One round of the simulation. Each wave covers a fixed window of simulated time in which every segment sees what has happened so far and chooses how to respond.
Segment	A group within the simulated population who share similar circumstances, values and likely reactions, represented by a single persona.
Persona	The detailed profile behind a segment — its stance, background story and personality — used to keep that segment's behaviour consistent across the simulation.
Stance	A segment's starting position on the policy question — supportive, opposed, conditional, undecided, etc. — before the simulation begins.
Intervention	A deliberate action injected into the simulation, such as a government announcement, to test how the population responds.
Event	An outside development injected into the simulation, such as a news story, that is not under the policymaker's control.
Stimulus	Collective term for interventions and events — any external input injected into the simulation to influence segment behaviour.
Strength	The intensity of a stimulus: low (minor, may be overlooked), medium (notable, should shift behaviour) or high (major, demands strong reactions).
Transient	A stimulus duration: injected at a single wave and then gone.
Sustained	A stimulus duration: active for a set number of consecutive waves after injection.
Permanent	A stimulus duration: once injected, remains as an established background condition for the rest of the simulation.
Net sentiment	The overall balance of positive versus negative reaction, from -1 (uniformly negative) to +1 (uniformly positive).
Polarisation	How strongly opinion is split into opposing camps, from 0 (broad agreement) to 1 (deeply divided).
Activity rate	The share of the population actively engaging — posting, replying, sharing or reacting — during a wave.
Cumulative disengagement	The share of the population that has stopped paying attention altogether by a given wave. Disengaged segments no longer react at all.

Term	Definition
Cascade rate	How quickly behaviour spreads between segments. A high cascade rate means one group's actions are triggering responses from others.
Convergence	How settled the simulation has become. High convergence means opinions and behaviour have largely stopped shifting.
Convergence threshold	The convergence level at which the simulation is judged stable enough to stop early.
Action mix	The distribution of action types across the simulation — how many posts, replies, shares, reactions, watches and ignores occurred in total.
Post / Reply / Share / React	The active ways a segment can engage in a wave: publishing its own message, responding to another segment, amplifying another segment's message, or registering a lightweight reaction.
Watch / Ignore	Passive responses: following the conversation without engaging, or paying it no attention in that wave.
Disengage	A permanent exit: the segment stops paying attention entirely and will not participate in any further waves.
Engagement probability	The likelihood that a segment will take an active action in a given wave, influenced by the time of day and how long the topic has been running.
Time horizon	The total simulated period the simulation covers, measured in hours from the initial event.
Segment relationship	A standing connection between two segments — for example allied or opposed — that shapes how one segment responds to the other's actions.
Risk level	The High / Medium / Low rating in the risk assessment, reflecting how likely a segment is to respond adversely and how much that response would matter.