Module 4:

EVALUATE HEALTH IMPACTS

LEARNING OBJECTIVES

By the end of this module, students will be able to:

- Describe the purpose of using the HHRS rating system to rate hazards
- Determine the likelihood and spread of harm outcomes of a hazard
- Use the HHRS formula to determine the hazard score.
- Evaluate the severity of the hazard score to prioritize appropriate interventions

The HHRS Process

Step 1
- Inspecting the Dwelling

Step 2
- Linking Deficiencies to Hazards

Step 3
- Scoring the Hazard

Step 4
- Determining the Appropriate Action

Review of Key Principles

HHRS is used to determine risks to health and safety

A dwelling should be safe & healthy for any occupant

Assessment is done without regard to costs and feasibility of interventions

Interventions will be prioritized based on the hazard's rating score

Categories of Hazards

Physiological Hazards	Psychological Hazards
Protection Against Infection	Protection Against Accidents

Categories of Hazards

A. Physiological Hazards • **Hygrothermal conditions** • **Pollutants (non-microbial)**	**C. Protection Against Infection** • **Hygiene** • **Sanitation** • **Water Supply**
B. Psychological Hazards • Space • Security • Light • Noise	**D. Protection Against Accidents** • Falls • Electric Shock • Burns and Scalds • Building-related Collisions

The HHRS Formula

Three figures used to generate hazard score:

- Likelihood the hazard will harm someone
- Possible harm from the hazard
- Weighting for each class of harm

Inspector considers likelihood and possible harm

Two Judgments by Assessor

HHRS requires the assessor to make two judgments for each hazard

- The likelihood, over the next 12 months, that the hazard could harm a member of the vulnerable group
- The potential harm outcomes if there is harm

First Judgment: Likelihood

Assessor judges likelihood, over next 12 months, that hazard could harm member of the vulnerable group

- Judgment limited to likelihood of hazard causing harm requiring medical attention
- Assessor considers deficiencies and whether they will increase or decrease the likelihood of harm

Judging Likelihood

Assessing likelihood is not determining or predicting that there definitely will harm.

LIKELIHOOD	5600	3200	1800	1000	560	320	180	100	56	32	18	10	6	3	2	1
	< 4200	2400	1300	750	420	240	130	75	42	24	13	7.5	4	2.5	1.5 >	

Judging Likelihood

Assessing likelihood does not mean harm will occur even when likelihood is very high

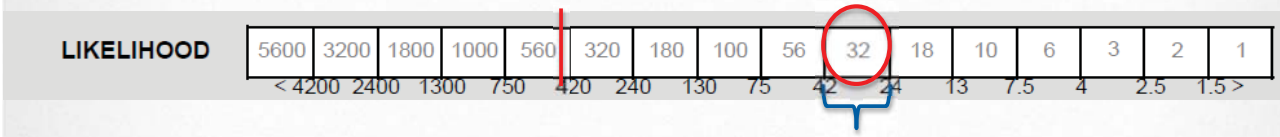
Inspector is not expected to give an exact likelihood ratio, but to select one of the standard HHRS likelihood ranges:

- e.g., the range of 1 in 24 to 1 in 42; or the range of 1 in 420 to 1 in 750.

Likelihood Numbers

- Hazard Profiles give national UK average likelihoods for vulnerable age group.
- Only assess hazards that presently cause, or are likely to cause harm, over next 12 months.
- The UK likelihoods are only a reference.

Likelihood for Mold & Moisture



Red line above where 1 in 430 falls on scale of likelihood

Observed no exhaust fan in the bathroom and a leaking sink

HHRS provides ranges of likelihood so not necessary to choose an exact number (as 1 in 430 is)

Assessor decides the likelihood is somewhere between 1 in 24 and 1 in 42 (see blue parentheses).

Assessor circles/selects "32" on his/her scoring sheet because that is the score mid-range between 24 and 42.

Determining Likelihoods

No "correct" or "incorrect" likelihood choices

Too many variables present in a dwelling that could impact likelihood

A secondary inspection may be required (e.g., lead paint or electrical)

Err on the side of caution when scoring until you can confirm with a secondary inspection if needed

Documentation and justification are critical!

Second Judgment: Outcomes

After judging the likelihood of an occurrence, the assessor makes the second judgment:

- What is the range of harm outcomes for the vulnerable age group that may result from the hazard?

Second Judgment: Outcomes

Four degrees of harm are considered based on evidence derived from UK hospital and doctor visit data.

- Class I – Extreme
- Class II – Severe
- Class III – Serious
- Class IV – Moderate

Classes of Harm (Harm Outcomes)

Examples of Class I:

- Death
- Permanent paralysis below the neck
- Malignant lung cancer
- Regular and severe pneumonia
- Permanent loss of consciousness
- 80% or more burn injuries

Examples of Class II:

- Asthma
- Non-malignant respiratory diseases
- Lead poisoning
- Legionnaires disease
- Mild stroke
- Chronic confusion
- Loss of a hand or foot
- Serious fractures
- Loss of consciousness for days

Classes of Harm (Harm Outcomes)

Examples of Class III :

- Rhinitis
- Hypertension
- Sleep disturbance
- Gastro-enteritis
- Chronic severe stress
- Loss of a finger
- Serious puncture wounds
- Regular and severe migraine

Examples of Class IV:

- Occasional severe discomfort
- Occasional mild pneumonia
- Broken finger
- Slight concussion
- Moderate cuts to face or body
- Mental stress
- Severe bruising to body
- Regular serious coughs or colds

Assessing the Outcomes

- When assessing spread of harm, consider:
  - Average spread of harm outcomes for the particular type/age of dwelling
  - Dwelling characteristics and conditions identified may increase or decrease the severity of those outcomes

Outcomes for Excess Heat

Excess Heat
Average likelihood and health outcomes for all persons aged 65 years or over, 1997-1999

Dwelling type & age		Average likelihood 1 in	Spread of health outcomes				Average HHSRS scores
			Class 1 %	Class II %	Class III %	Class IV %	
Houses	All ages	–	31.0	8.0	25.0	36.0	0 (J)
Apts	Pre 1920	60,000	31.0	8.0	25.0	36.0	5 (J)
	1920-45	90,000	31.0	8.0	25.0	36.0	4 (J)
	1946-79	130,000	31.0	8.0	25.0	36.0	3 (J)
	Post 1979	110,000	31.0	8.0	25.0	36.0	3 (J)
All Dwellings		**900,000**	**31.0**	**8.0**	**25.0**	**36.0**	**0 (J)**

Outcomes for Excess Heat

- When scoring, you are considering how the deficiencies contribute to harm in each Class.
- Unless the conditions call for adjusting the outcomes, they should be accepted as-is.
- The sum of the classes will total 100%.

OUTCOMES		<0.05	0.15	0.3	0.7	1.5	3	7	15	26	38 >		
	Class I	0	0.1	0.2	0.5	1.0	2.2	4.6	10.0	21.5	31.6	46.4	31.6
	Class II	0	0.1	0.2	0.5	1.0	2.2	4.6	10.0	21.5	31.6	46.4	10
	Class III	0	0.1	0.2	0.5	1.0	2.2	4.6	10.0	21.5	31.6	46.4	21.5
		<0.05	0.15	0.3	0.7	1.5	3	7	15	26	38 >		

Class IV

100-(I+II+III)

36.9

The Numerical Score

- The hazard score is determined by adding up the individual scores from each class of harm using the standard formula.
- The likelihood remains constant but the weight of each class alters the score for that class.

BOX 7. Generating a Hazard Score

Class of Harm Weighting			Likelihood		Spread of Harm (%)		Score
Class I	10,000	X	1/18	X	4.6	=	2,556
Class II	1,000	X	1/18	X	10.0	=	556
Class III	300	X	1 /18	X	21.5	=	358
Class IV	10	X	1/18	X	63.8	=	35
					Hazard Score	=	**3,505**

The Result – Hazard Bands

Hazard bands devised to avoid emphasis being placed on what may appear to be a precise numerical hazard score.

There are ten hazard bands (see pg. 19 in the Operating Guidance)

- Band A: most dangerous
- Band J: least dangerous

Band Hazard Score Range

Band	Score
A	5,000 or more
B	2,000 to 4,999
C	1,000 to 1,999
D	500 to 999
E	200 to 499
F	100 to 199
G	50 to 99
H	20 to 49
I	10 to 19
J	9 or less

PRACTICE:

DETERMINING LIKELIHOODS, OUTCOMES, HAZARD SCORES AND BANDS

SCORING A HAZARD: THE COMPLETE PROCESS

Using the scoring tool, available on HUD's website, and all our knowledge thus far, let's practice:

- Determining likelihood and outcomes
- Determining the hazard
- Determining hazard band

Falling on level surfaces

Mold and moisture

Falling on stairs and falling between levels

Exercise

What are the four categories of hazards in the HHRS?

- The hazard "Entry by Intruders" is in which of these?
- The hazard "Asbestos and MMF" is in which of these?
- The hazard "Falling Associated with Baths" is in which of these?
- The hazard "Crowding and Space" is in which of these?

What three factors make up the hazard score?

What happens to the hazard score once all the four classes of harm scores are added up?

Review

- Describe the purpose of using the HHRS rating system to rate hazards
- Explain how to determine the likelihood and spread of harm outcomes of a hazard
- Use the HHRS formula to determine the hazard score
- Evaluate the severity of the hazard score to prioritize appropriate interventions