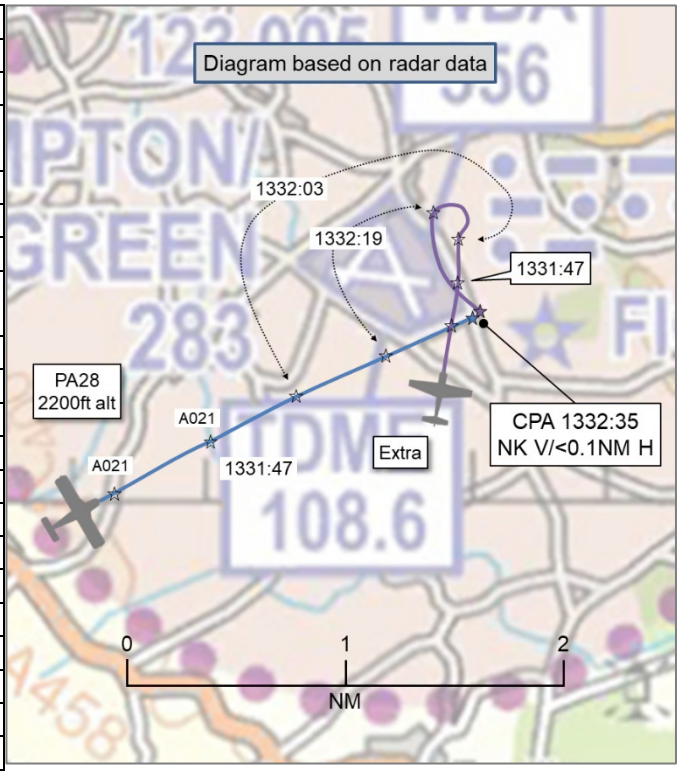
AIRPROX REPORT No 2022242

Date: 25 Sep 2022 Time: 1333Z Position: 5231N 00215W Location: Halfpenny Green

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA28	Extra
Operator	Civ FW	Civ FW
Airspace	Halfpenny Green ATZ	Unknown
Class	G	G
Rules	VFR	VFR
Service	AFIS	AFIS
Provider	Halfpenny Green Information	Halfpenny Green Information
Altitude/FL	2200ft	NK
Transponder	A, C	A, S[1]
Reported		
Colours	White, Purple	White
Lighting	Nav, Strobe	Nav, Strobe
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2000ft	2500ft
Altimeter	QFE (1007hPa)	QFE (NK hPa)
Heading	~090°	160°
Speed	~90kt	Variable
ACAS/TAS	Not fitted	Not fitted
Separation at CPA		
Reported	0ft V/300ft H	500ft V/600m H
Recorded	NK V/<0.1NM H	



THE PA28 PILOT reports that at circa 1320 they radioed inbound from Chelmarsh Reservoir at 2300ft, QNH 1018hPa, looking for a standard overhead/deadside join. Halfpenny Green Information asked that they report in the overhead at 2000ft QFE 1007hPa for RW34. At a similar time the Extra departed the active RW34 and the pilot radioed that they were going to carry out an aerobatic detail in the overhead not below 3000ft altitude. At circa 1325, they entered the ATZ direct from Chelmarsh Reservoir at 2000ft on QFE 1007hPa and passed directly over the '34 numbers' in order to descend on the deadside, at which time [the Extra pilot] pulled up vertically from below them at a range of approximately 300ft horizontal distance from them in their 10 o'clock relative position, obviously from executing an aerobatic manoeuvre. The PA28 pilot had no time to react and immediately radioed the AFISO to advise them of the aerobatic manoeuvre that had just taken place. The AFISO replied that [the Extra pilot] should only be doing aerobatics above 3000ft. This was clearly not the case as [the Extra] had descended into the active ATZ, below 2000ft, and pulled up sharply. The response from [the Extra pilot] was that they had misjudged the manoeuvre, they then departed the overhead out to the west of the airfield. Following landing, the PA28 pilot went to the control tower and spoke to both FISOs about the incident. The PA28 pilot asked them what the cloudbase was at the time and who was flying [the Extra]. Their reply was that the cloudbase was approximately 3600ft via the cloud reading instrument, and that [name redacted] was flying the aircraft. The PA28 pilot opines that this aerobatic manoeuvre was [unwise] and should be stopped. It could have easily ended up with [a collision]. With a cloudbase of 3600ft, it was clear that [the Extra pilot] was going to struggle to carry out their aerobatic detail above 3000ft, and it was obvious that they knew this, hence they must have commenced their detail below their own safety height of 3000ft. The PA28 pilot reports that they're all for having fun while flying, that's why people do what they do, and they are aware that people make mistakes, but being a pilot at any level be it LAPL, PPL, CPL etc, comes with great responsibility and a Duty of Care.

[1] No Mode C readout was detected by the NATS radars.

The pilot assessed the risk of collision as 'High'.

THE EXTRA PILOT reports that they were performing aerobatic training in the overhead, with the agreement of the airfield at an agreed minimum altitude of 3000ft, and in two-way communication with the airfield station. [The PA28] was joining the circuit via the overhead at 2000ft from the west, heading towards the southern end of RW16. [The pilots of] both aircraft were aware of each other via radio calls and visually, whilst [the Extra] began a descent to increase speed to enter a manoeuvre. Realising being level at 2500ft [the Extra] was below the working minimum height agreed, the PIC/Instructor said "pull up" to the student in control. This was incorrectly taken to mean pull up into a manoeuvre, rather than simply to increase height. The instructor then took control, and with [the PA28] in sight, continued the manoeuvre into a loop, exiting at 2500ft behind [the PA28] which was now to the east of the overhead maintaining 2000ft and flying away from [the Extra], with an estimated vertical separation of 500ft. The decision to fly a loop was made as [the PA28's] position was known and identified visually before the change in pitch, it was known to be there (whereas any potential traffic behind and low may not have been seen), and the PIC of [the Extra] had [the PA28] visual throughout the second half of the looping figure. The PIC of [the Extra] does not consider the incident to be an Airprox, and it is not known at which point the PIC of [the PA28] considered an Airprox was occurring, as horizontal and vertical separation was maintained, and neither aircraft was required to alter height nor heading to avoid a collision risk, as a video taken from the ground (eastern side of the airport) clearly showed. However, the PIC of [the Extra] recognises that aerobatic manoeuvres may cause undue alarm to pilots of other aircraft who may not be sure during rapid changes in height, heading and speed what the aerobatic aircraft is doing, and they immediately left the overhead and ceased further aerobatic flights in the overhead, announcing this intention. They also discussed this thought internally with the operator immediately after the flight. It was felt that there were three contributing factors: 1. The cloudbase of 3600ft may have led the student to naturally allow more room than was required. 2. The command "pull up" was open to interpretation given the type of flight. 3. The pilot of the other aircraft will not have known for sure if any sudden change in height or heading of the aerobatic aircraft may cause a potential Airprox. The following corrective actions were therefore agreed: 1. In consultation with the airfield, it has been suggested that aerobatics in the overhead only take place with a minimum cloudbase of 4000ft AGL, and with a minimum visibility of 8km, whilst maintaining a base of 3000ft AGL, and in two way communication with the local base station. 2. The operator will review how instruction is given so that there is a clear command to cease aerobatics and perform a height or heading change that cannot be confused with entering an aerobatic manoeuvre. This will be thoroughly briefed pre-flight.

The pilot assessed the risk of collision as 'Low'.

THE WOLVERHAMPTON HALFPENNY GREEN AFISO reports that as they remember it, [the Extra] had taken off for an aerobatic detail above the airfield's ATZ not below 3000ft. [The PA28], not long after, had entered the ATZ on a standard overhead join at 2000ft QFE. This was quickly followed by a radio call [from the PA28 pilot] stating that [the Extra] had just missed them in a manoeuvre. Nobody present in the tower saw it. Somewhat puzzled, their immediate response was that the aircraft was not to be below 3000ft. The pilot of [the PA28] said yes they knew that, at which point the pilot of [the Extra] said something along the lines of 'they'd misjudged a manoeuvre', followed by a call saying they were going to depart to the west for a while. They do not recount any calls from [the Extra pilot] alerting the Tower [sic] to the fact the aircraft had gone below the agreed minimum of 3000ft above an active ATZ. They don't think there was even an apology given to [the PA28 pilot]. They added that, on what was a very busy tiring day with a mixture of both pleasure flying helicopter and fixed wing traffic, and numerous visiting aircraft, is to the best of their knowledge how they remember it.

Factual Background

The weather at RAF Cosford was recorded as follows:

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METAR EGWC 251250Z 27006KT 9999 FEW028 SCT032 14/07 Q1019 RMK BLU
METAR EGWC 251350Z 28007KT 9999 BKN035 14/06 Q1018 RMK BLU
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Analysis and Investigation

Wolverhampton Halfpenny Green safety report.

The operation of [The Extra] had occurred at Wolverhampton Halfpenny Green on two other occasions without incident. It is noted that 11 out of the 12 flights over that weekend had occurred without issue.

The actions of the pilot of [the PA28] appeared totally correct in undertaking the standard overhead join and whilst aware of the [the Extra, they] would not have expected to see the aircraft operating below the 3000ft agreed level.

The cause of the incident was due to pilot error of the pilot of [the Extra] flying below an agreed base level of 3000ft QFE. In attempting to correct the loss of height, poor communication between the instructor and their student led to the commencement of a loop manoeuvre rather than a basic regain of the height loss.

Whilst the pilot of [the Extra] stated that it was felt that some separation was maintained, the surprise to the pilot of [the PA28] without warning would likely have been considerable, and very disconcerting. It is also noted that this incident happened between two aircraft being captained by instructors. Had it been less experienced personnel involved the potential impact, certainty and stress caused could have been greater.

However, the main concern is that a decision was made by the [Extra] pilot to undertake aerobatics within an apparent small 600ft window, with a cloudbase of 3600ft QFE with a student. Whilst the pilot of [the Extra] stated that they had enough room to undertake the manoeuvre, the decision to commence when other options away from the circuit where available has to be questioned. This being compounded with the mis-communication between the instructor and student leading to the incident. Consequently, it is felt that the incident was 100% avoidable had safer decisions been taken.

It was noted within the Wolverhampton Halfpenny Green Airport safety incident report that the pilot of [the PA28] felt that aerobatics in the overhead should be stopped. This was discussed with all operators including [the pilot of the PA28] who has agreed that the following precautions introduced would be an acceptable compromise. Consequently, a minimum cloudbase of 4000ft QFE and a base level of 3000ft QFE with a visibility of 8km would be required before any aerobatic flight would be allowed in the overhead. Aerobatics would not be allowed in the event of a first solo being undertaken or an aircraft declaring an emergency. The onus being on the pilot to confirm the criteria prior to commencing and it being in line with their own Standard Operating Procedures (SOPs).

Modifications to both the Aerodrome Manual and FISO Local Instructions will be made confirming the above, following the Wolverhampton Halfpenny Green Airport Change Procedures.

A letter has been written to [the Extra pilot] with details of the findings and a confirmation sought in writing from them and [the aerobatics operating organisation] that this incident has been internally reviewed and the changes detailed confirmed to be in their Standard Operating Procedures at this airfield. No further aerobatics operations by [the aerobatics operating organisation] or [the Extra pilot] are to take place until this is confirmed in writing.

CAA ATSI

CAA ATSI has reviewed the RT transcript for this event and noted that the PA28 pilot had been aware of the activity of the Extra prior to rejoin. Therefore, although Traffic Information could have been passed to the PA28 pilot regarding the Extra, as the PA28 pilot already knew of the Extra pilot's activity, the passage of the Traffic Information would not have had any bearing on this event.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the PA28 was detected and identified with cross reference to the pilot's report. The Extra was detected and identified using Mode S data. Prior to the Airprox, the radar return generated by the Extra was constant and steady however, immediately before the Airprox the return became subject to some radar jitter and this continued until after the Airprox. It is not uncommon for radar returns from aircraft that are involved in high energy manoeuvres with rapid changes of direction to be subject to radar jitter, therefore the diagram contained in this report is a best representation of the flight path of the Extra. Also, for the period during which the Airprox occurred, the Mode C altitude reporting from the Extra's transponder was not detected by the NATS radar, as a result it has not been possible to measure a vertical separation between the aircraft.

The PA28 and Extra pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation.[3] An aircraft must not fly, take off or land within the aerodrome traffic zone of an aerodrome unless the commander of the aircraft has obtained information from the flight information centre to enable the flight to be conducted safely within the aerodrome traffic zone.[4] When an aircraft carries a serviceable SSR transponder, the pilot shall operate the transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where SSR is used for ATS purposes.[5]

Summary

An Airprox was reported when a PA28 and an Extra flew into proximity overhead Halfpenny Green at 1333Z on Sunday 25th September 2022. Both pilots were operating under VFR in VMC, both in receipt of an AFIS from Halfpenny Green Information.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the AFISO involved and reports from the appropriate operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first considered the actions of the PA28 pilot and noted that they had, in accordance with the AIP, been joining via the overhead. Members discussed whether an overhead join had been appropriate whilst the Extra pilot had been operating in the airfield overhead and concluded that, in the PA28 pilot's mental model, the Extra would not have been below 3000ft, which had been the altitude agreed between the Extra pilot and the AFISO, and therefore the overhead join had been an appropriate course of action. However, as the Extra had actually been below this altitude, the mental model of the PA28 pilot, and therefore their awareness of the Extra, had been inaccurate (**CF9**). Members next considered the point at which the PA28 pilot had become visual with the Extra and agreed that this had happened at a time which had been too late for the PA28 pilot to have been able to take any effective avoiding action (**CF11**).

Next, members discussed the actions of the Extra pilot and a civil controller member stated that, by agreeing to operate not below 3000ft in the airfield overhead, the Extra pilot had effectively created a contract with the AFISO, to which they had subsequently not adhered by descending below that level (**CF3**, **CF5**). The Board noted that the Extra pilot had recognised that they had been below their agreed altitude for the aerobatics and had instructed their student to gain altitude, however this instruction had been misinterpreted (**CF4**) and, once the student had commenced their incorrect manoeuvre, the

[2] (UK) SERA.3205 Proximity.
[3] (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome.
[4] The Rules of the Air Regulations 2015, Section 3, Article 11(4).
[5] (UK) SERA.13001. Operation of an SSR transponder.

instructor had not acted appropriately to correct them (**CF8**). A GA aerobatic pilot member commented that, prior to each and every manoeuvre, it is good practice to conduct a HASELL[6] or HELL[7] check and the Board wondered whether this had been done prior to the Extra pilot's decision to continue the pull up into a loop. Members agreed that the Extra pilot had had a generic awareness of the presence of the PA28 (**CF9**) and that it had been joining overhead and therefore creating a pattern of traffic at the airfield. The Board concluded that, although the Extra pilot had been aware of the PA28, they had continued to fly close enough to it to have caused its pilot some concern (**CF7**), and in doing so they had insufficiently avoided the pattern of traffic (**CF6**). Members were satisfied that the Extra pilot had been visual with the PA28 during the manoeuvre, however agreed that the visual acquisition had occurred at a later than optimum point (**CF10**). A GA aerobatic pilot added that a loop in an Extra typically requires 1000ft of vertical space, although it can be completed in 600ft but this would require a G-loading of approximately 5G, and suggested that once in the loop, the Extra pilot could have exited at the top to avoid once again going below their 3000ft base whilst also maintaining separation from the PA28.

Members then examined the involvement of the AFISO and quickly agreed that their mental model had been inaccurate (**CF2**), as their understanding had been that the Extra would not have been below 3000ft. The Board agreed that, with the Extra above 3000ft, the AFISO would not have been required to pass Traffic Information to the PA28 pilot regarding the Extra's activity (**CF1**).

Finally, in assessing the risk of collision, the Board agreed that both pilots had had generic awareness of the presence of the other aircraft, however, the PA28 pilot's mental model had been inaccurate. Members commented that the PA28 pilot had become visual with the Extra at a point which had been too late for them to have taken any effective avoiding action and, although the pilot of the Extra had become visual with the PA28, which had reduced the risk of collision, it had not removed it entirely as it had been at a later than optimum time. Members agreed that, in this case, safety had not been assured and that there had been a risk of collision (**CF12**). Accordingly, the Board assigned a Risk Category B to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022242			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
2	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
3	Human Factors	• Use of policy/Procedures	Events involving the use of the relevant policy or procedures by flight crew	Regulations and/or procedures not complied with
	• Tactical Planning and Execution			
4	Human Factors	• Accuracy of Communication	Events involving flight crew using inaccurate communication - wrong or incomplete information provided	Ineffective communication of intentions
5	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
6	Human Factors	• Monitoring of Environment	Events involving flight crew not to appropriately monitoring the environment	Did not avoid/conform with the pattern of traffic already formed
	• Situational Awareness of the Conflicting Aircraft and Action			

[6] Items to check for a HASELL check are: Height, Airspace, Security, Engine, Location, Lookout.
[7] Abbreviated HASELL check comprising of: Height, Engine, Location, Lookout.

7	Human Factors	• Lack of Action	Events involving flight crew not taking any action at all when they should have done so	Pilot flew close enough to cause concern despite Situational Awareness
8	Human Factors	• Mentoring	Events involving the mentoring of an individual	
9	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
	• See and Avoid			
10	Human Factors	• Identification/ Recognition	Events involving flight crew not fully identifying or recognising the reality of a situation	Late sighting by one or both pilots
11	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots
	• Outcome Events			
12	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk: B

Safety Barrier Assessment[8]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the AFISO's mental model regarding the operating area of the Extra had been inaccurate, leading them to believe that the Extra and the PA28 had been separated and so they had not passed Traffic Information to the PA28 pilot.

Flight Elements:

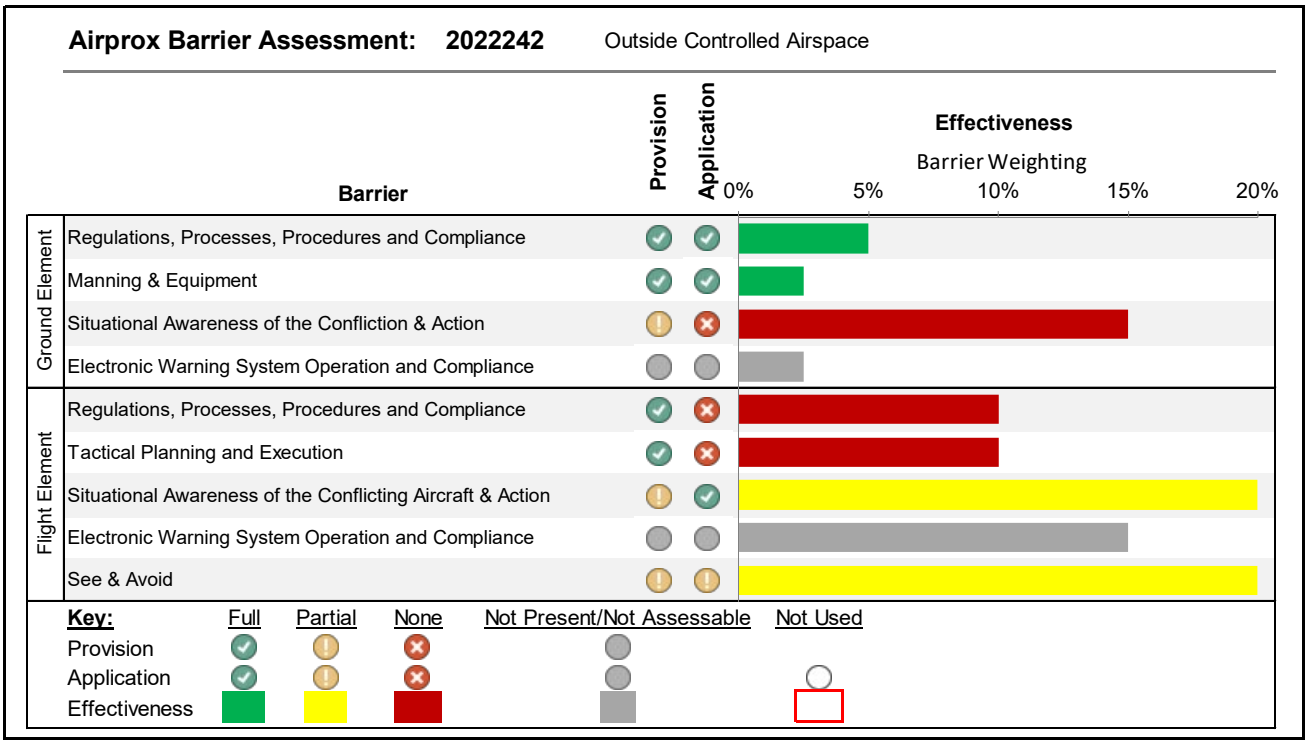
Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because, although the Extra pilot had stated that they would not be below 3000ft, they had descended below that level, which had also meant that they had not avoided the pattern of traffic established by the joining PA28.

Tactical Planning and Execution was assessed as **ineffective** because the Extra pilot had descended below their agreed minimum altitude and the instruction to pull up issued by the Extra pilot had been misinterpreted by their student.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because, whilst the Extra pilot had had a generic awareness that the PA28 had been joining the circuit, the mental model of the PA28 pilot had been inaccurate, as they had believed that the Extra had been higher.

See and Avoid were assessed as **partially effective** because the Extra pilot had visually acquired the PA28 at a later than optimum time, and the PA28 pilot had become visual with the Extra at a point when it had been too late for them to have taken any effective avoiding action.

[8] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.


Airprox Barrier Assessment: 2022242
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
0%
5%
10%
15%
20%
Ground Element
Regulations, Processes, Procedures and Compliance
Manning & Equipment
Situational Awareness of the Confliction & Action
Electronic Warning System Operation and Compliance
Flight Element
Regulations, Processes, Procedures and Compliance
Tactical Planning and Execution
Situational Awareness of the Conflicting Aircraft & Action
Electronic Warning System Operation and Compliance
See & Avoid
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness